SONY

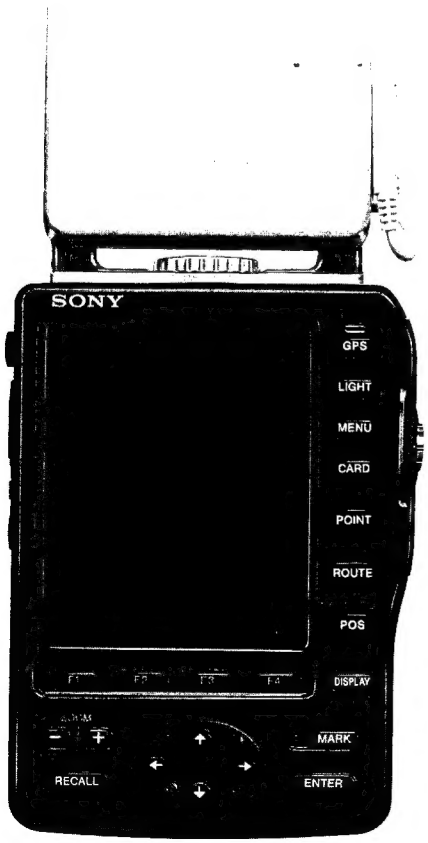
3-756-359-21 (1)

GPS (Global Positioning System) Receiver

IPS-760

Operating Instructions

Before operating the unit, please read this manual thoroughly and retain it for future reference.



PYXIS

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Owner's Record

The model and serial numbers are located at the rear. Record the serial number in the space provided below. Refer to them whenever you call upon your Sony dealer regarding this product.

Model No. IPS-760 Serial No. _____

WARNING

This equipment has been tested and to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications, may cause harmful guarantee that interference will not occur in a particular installation. If this equipment does couse harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

RECYCLING NICKEL-CADMIUM BATTERIES

Ni-Cd

NICKEL-CADMIUM BATTERY.
MUST BE DISPOSED OF PROPERLY.

Nickel-Cadmium batteries are recyclable. You can help preserve our environment by returning your unwanted batteries to your nearest Sony Service Center for collection, recycling or proper disposal.

Note: In some areas the disposal of nickel-cadmium batteries in household or business trash may be prohibited.

For the Sony Service Center nearest you call 1-800-222-SONY(United States only)

Caution: Do not handle damaged or leaking nickel-cadmium batteries.

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Features

Congratulations on your purchase of the Sony IPS-760 GPS (Global Positioning System) Receiver. The IPS-760 uses GPS signals to provide you with essential navigation information, such as latitude, longitude, and velocity.

You can use the IPS-760 to help you navigate in a variety of locations and activities including:

- At sea: Boating, fishing, sailing
- On land: Hiking, mountaineering, driving
- In the air: Flying, hang-gliding

You can use the IPS-760 to:

- Determine your current position
  - display your current position.
  - store your current position.
- Navigate to your destination
  - store the latitude and longitude data of the positions.
  - display the distance and the direction to your destination.
  - plan your navigation route, for navigating to your destination via the route.
  - notify you of course deviation.
  - notify you of reaching a destination point.
- Display and track the course travelled.

The IPS-760 is also versatile, allowing you to set it up and use it in a variety of ways. You can:

- Remove the antenna from the display/keyboard unit for remote installation.
- Light the display screen, buttons, and keys so you can use the unit even in dark places.
- Use IC memory cards in the two available card slots. You can use these cards to store navigation information and display maps using IC memory cards that contain map data.
- Output data via RS-232C and to the marin plotter using the Interface Module (not supplied).

Note:
For nautical and aeronautical navigation, use this unit only as a backup and supplement to the navigation charts required by the relevant regulatory body.

About This Manual

Using this manual you will be able to setup and operate IPS-760 – even if you are unfamiliar with GPS or navigation concepts.

This manual is divided into the following chapters:

- Chapter 1, "Setting Up the Unit," describes how to set up the unit. It guides you through the setup and initial settings you must make before you can start using the unit.
- Chapter 2, "Getting Started With the Unit," describes how to use the unit. It also presents an overview of the operation modes and explains how to use the display and operation keys.
- Chapter 3, "Customizing the Unit," describes how to change the unit's default settings to suit your individual needs. You can change the display, positioning conditions, clock, alarms, and system settings.
- Appendixes provide miscellaneous information about the unit, such as optional accessories, troubleshooting tips, reference charts, display symbols and abbreviations, and specifications.

GPS Overview

This section introduces you to the GPS system, which is the system used by the unit to acquire navigation information.

What is GPS?

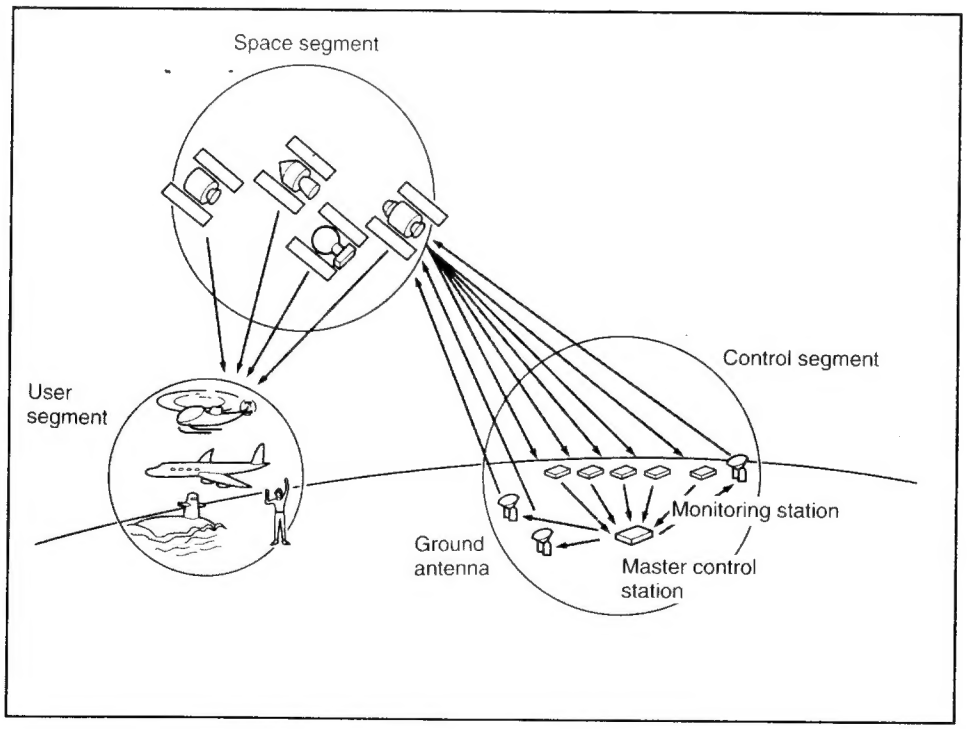
The Global Positioning System (GPS) is a satellite-based navigation system developed and maintained by the United States Department of Defense (DoD). The system, which was originally designed for military purposes, includes a separate signal (C/A code) for civilian use.

A GPS receiver, such as the IPS-760, uses the GPS satellite signals to determine your precise geographic location, including latitude, longitude, and altitude. The GPS signals are available worldwide 24 hours a day.

Segments of the GPS system

The GPS system is made up of three segments:

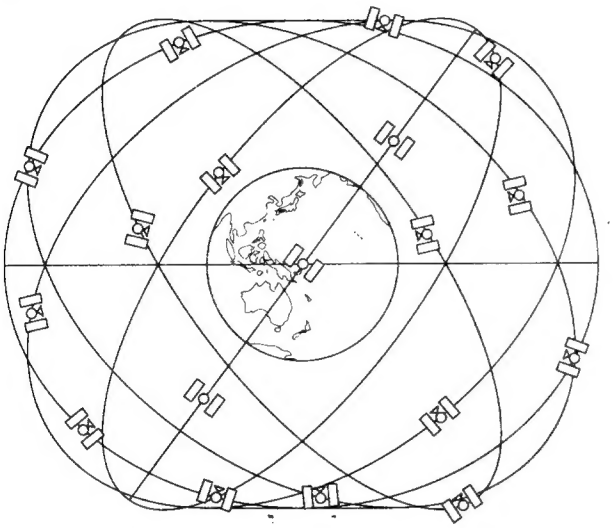
- The space segment, which will – when completed – be composed of 22 satellites (and two operational spares) in six orbits. The satellites transmit signals with highly accurate orbital and timing information.
- The control segment, which consists of a master control station, five remote monitoring stations, and three ground antennas. The monitoring stations track the GPS satellites. The data gathered by the monitoring stations is processed by the master control station, which updates the orbital information of each satellite. The updated information is transmitted to each GPS satellite by the ground antennas.
- The user segment, which consists of the GPS receiver.



GPS Overview

Calculating positions

The GPS satellites transmit signals relative to their position and the timing signal. By multiplying the time the timing signal takes to reach the receiver by the velocity of radio wave (3 x 10^8 m/s), the GPS receiver calculates the distance between the satellite and the receiver itself. The receiver's position is defined by the cross point of spheres whose radius correspond with the distance from each satellite. Therefore, the receiver can calculate its position: latitude, longitude, altitude* when it receives signals from four satellites.



* The unit calculates the altitude based on the World Geodetic System (WGS84) coordinates. This altitude is not relative to the height above sea level.

Methods of position

The unit can provide you with either a two- or three-dimensional position, depending on satellite availability.

- Two-dimensional position: The unit uses three satellites to determine a two-dimensional position: latitude and longitude.The unit employs the altitude that has been calculated during the latest positioning.
- Three-dimensional position: The unit uses four satellites to determine a three-dimensional position: latitude, longitude, and altitude.

GPS system specifications

Satellite altitude:	About 20,000 km (10,900 miles)	
Satellite orbit:	About a 12-hour-cycle elliptical orbit	
Signal format:	P code – used for military applications; C/A code – used for civilian applications. The IPS-760 uses the C/A (Coarse Acquisition) code signals.	
C/A code:	Frequency	1575.42 MHz
	Clock	1.023 Mbps
	Orbit data speed	50 bps
	Signal strength	–160 dBw
Modulation:	Direct Sequence	
Accuracy:	30 m (98 feet), DOP** ≤ 6, with S/A*** OFF	

** DOP (Dilution of Precision) is an indication of the accuracy of the position based on satellite geometry (the position of the satellites relative to the earth). When the GPS satellite constellation is complete, there will be a minimum of five satellites in view with a DOP of six or less to any user worldwide.

*** S/A (Selective Availability) is a method for the government to control the accuracy of the GPS signals. With S/A on, the accuracy may be degraded to 100 meters.

Warning:
GPS system signals are maintained and controlled by the United States Department of Defense (DoD). Without notice, the DoD can change the characteristics of this signal, which will degrade the accuracy of this unit. Use the IPS-760 at your own risk.

Receiving GPS Satellite Signals

This section briefly explains the GPS satellite reception.

Guidelines for reception

To ensure the best possible satellite reception, follow these guidelines when setting up and using the unit:

- Place the antenna horizontally, with no line-of-sight obstructions. The fewer the obstructions, the better the unit can receive satellite signals.
- Keep in mind that certain objects, such as dense tree coverage, buildings, your body, etc., may interfere with the GPS satellite signal reception.
- The satellite signals can be received through certain materials such as glass, fiberglass, or acrylic.
- As the satellites move low on the horizon, reception may become poor.
- The satellite constellation is not yet complete: not all satellites are in orbit, and the existing satellites undergo periodic testing. Therefore, there may be times when there are not enough satellites to determine your position.

About the positioning time

The GPS satellites transmit orbital and timing information. This information is called a "navigation message" and is transmitted in 30 seconds of data row. The orbital information included in the navigation message is called the "broadcast ephemeris." 22 satellites (and two operational spares) transmit the navigation message with their own orbital information and timing information. The common information such as orbital information for all satellites are also included in the transmitted information, which is called an "almanac." Almanac data is used to determine the positions of each satellite when acquiring the current position.

If the GPS receiver has the orbital information for all satellites in its memory and knows the approximate allocation of the satellites, and then it receives 30 seconds of data row once and stores them in its memory, it can continuously calculate its current position. The data is valid for a few hours.

The unit can calculate your current position a few minutes after you have input your approximate current position on initial setting. After turning on the unit, if you wait for about one minute to continuously receive the orbital information in a location with no line-of-sight obstructions, you can acquire your current position quickly. It may take a little longer to acquire your current position while moving because the unit receives the orbital information intermittently.

Because this unit is an 8-channel parallel receiver, it can search for the satellites that are not used for calculating the current position, and gather the orbital information.

Under the following conditions, the unit will take about 20 minutes (or more than one hour, depending on the reception condition) to acquire the current position:
- When you execute the "GPS Reset" option
- When you replace the built-in lithium batteries

GPS Coordinates

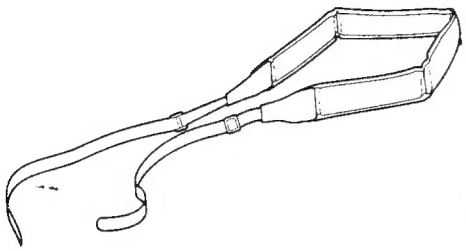
GPS determines latitude, longitude and altitude by defining the earth as an ellipsoid that revolves on its axis. This system is called the WGS84 (World Geodetic System 1984) coordinate system. Conventional maps and charts use different coordinate systems, depending on the location.

The unit calculates the latitude, longitude and altitude as determined by the WGS84 coordinate system, which uses a single coordinate system for the world. The unit displays the WGS84 coordinates by default. Therefore, the coordinates displayed by the unit may not be identical with those found in an atlas. You must set the appropriate Geodetic System in the Position Setting menu to have the unit display coordinates which correspond to the map or chart you may be using. Instructions for setting up the unit – including selecting your Geodetic System – are discussed in Chapter 1.

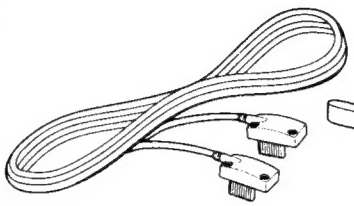
Unpacking the Unit

As you unpack the unit, check that the following items are included.
If anything is missing, contact your nearest Sony dealer.

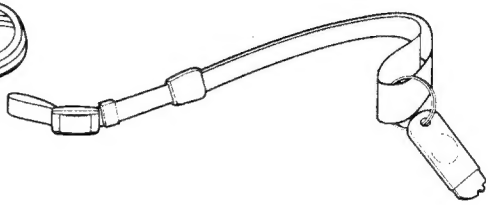
• Floating belt



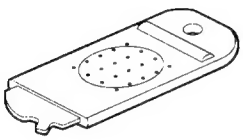
• Antenna extension cable (3 m or 10 ft length)



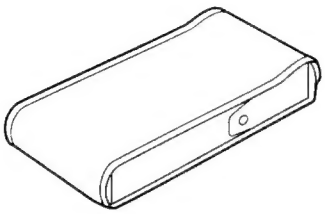
• Carrying strap



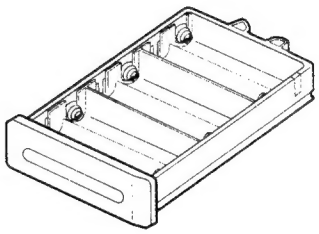
• Utility key



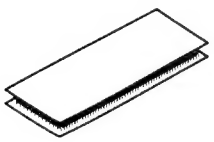
• Carrying case



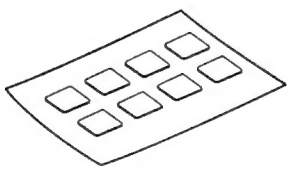
• Battery magazine



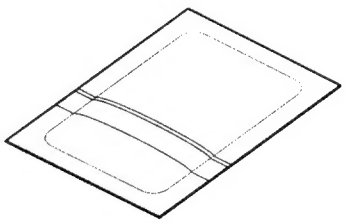
• Velcro tapes



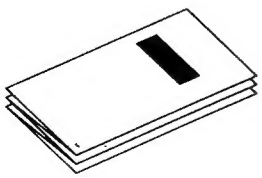
• Two-sided adhesive tapes



• Contact cleaning tissue



• Quick Start card



Locating the Controls

This section explains the location and function of the parts and controls you use to operate the unit.

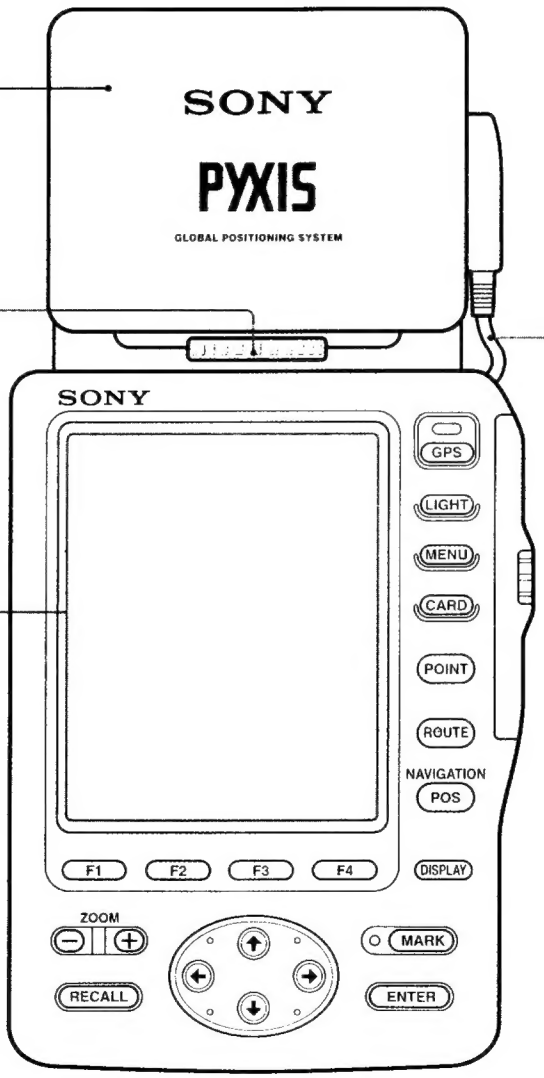
Main Unit

Front

Antenna
Receives and processes the radio signals from the GPS satellites. Adjust the antenna's angle to make the antenna horizontally oriented to the sky while using the unit.

Antenna holder
Holds the antenna and connects it to the display/keyboard unit. Adjusts the antenna's angle. To remove the antenna holder from the antenna and the display/keyboard unit, loosen the screws that hold both the antenna and the display/keyboard unit.

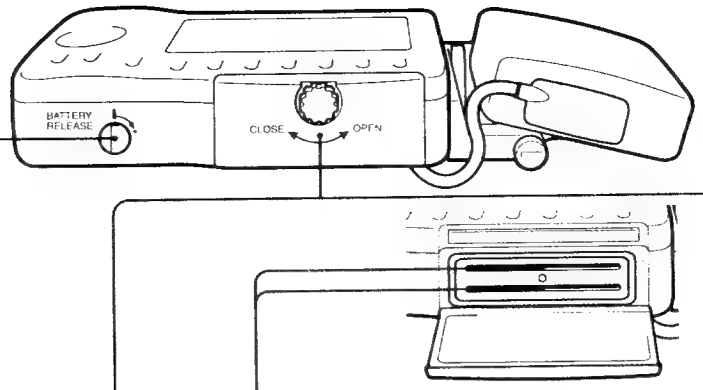
Liquid Crystal Display (LCD)
Displays the information received from the GPS satellites, IC memory cards, etc.



Antenna cable
Connects the antenna to the display/keyboard unit.

Locating the Controls

Right side



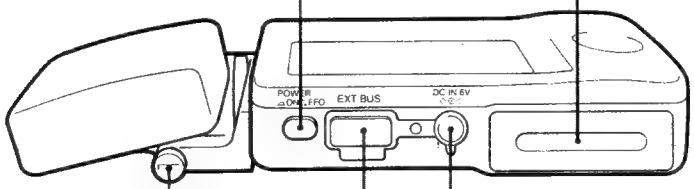
BATTERY RELEASE screw
Use this screw to remove the battery magazine from the unit. To remove the battery magazine, turn the screw in the direction of the arrow to the "." mark using the utility key (supplied).

IC memory card slots
These slots hold the IC memory cards. You can use two cards at the same time. To insert a card, turn the screw toward "OPEN," then open the cover. When closing the cover, turn the screw toward "CLOSE." To remove the card from the slot, put the utility key into the card's groove, then pull the card using the utility key.

Left side

Battery magazine
Houses six R6 (size AA) alkaline batteries. To insert the battery magazine into the unit, push the battery magazine until the BATTERY RELEASE screw returns to center. To remove the battery magazine from the unit, turn the BATTERY RELEASE screw in the direction of the arrow to the "." mark.

POWER button
Turns the power on and off.

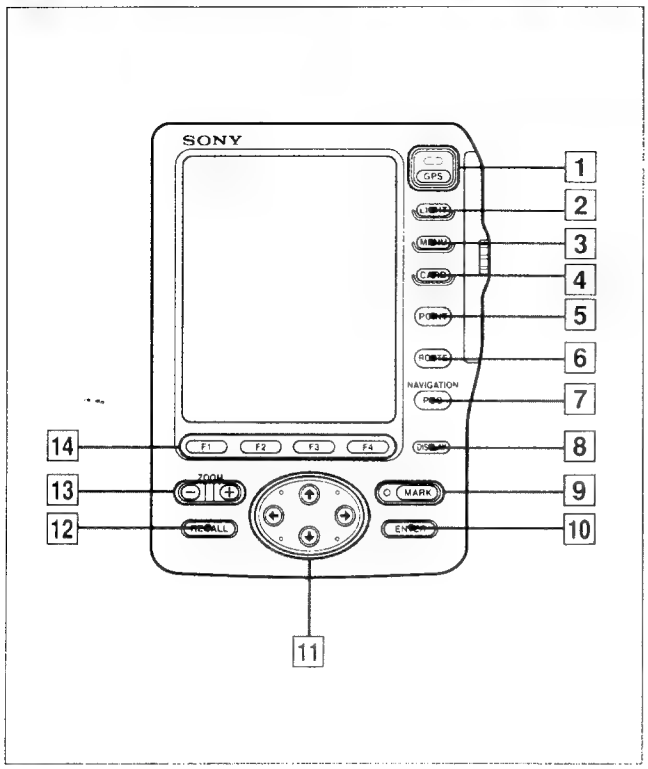


Antenna adjustment screw
Adjusts the antenna's angle. This screw is located at both sides. To loosen the screw, turn it counterclockwise. Turning the screw clockwise makes the antenna less movable.

EXT (External) BUS connector
Used for data communication between the unit and other equipment.

DC IN 6V jack
Connects to the DCC-E260HG car battery cord (not supplied).

Key Overview



1 **GPS key**
Turns power to antenna on and off. To turn off the antenna, press and hold the GPS key for more than three seconds. The GPS key always turns on when the unit powers on.

When the position update rate is set to Continuous, press this key to turn on the antenna (light is green). Press the key again to turn off the antenna (light is off).

When the position update rate is set to Interval, press this key to turn on the antenna at interval rate (light is red). Pressing the key again changes the position update rate to Continuous (light is green). Then press the key to turn off the antenna (light is off).

The key's light flashes green and red when you approach or reach your destination, or when you deviate from your course.

2 **LIGHT key**
Turns the display's backlighting and the keypad illumination on and off.

3 **MENU key**
Displays the menu screen (MENU mode). In this mode, you can make various system settings, display the satellite status and point memo, calculate the distance, and more.

4 **CARD key**
Enters CARD mode. In this mode, you can operate IC memory cards. You can move data to and from cards, load data from cards, and more.

5 **POINT key**
Enters POINT mode. In this mode, you can create, modify, delete, and search for navigation points.

6 **ROUTE key**
Enters ROUTE mode. In this mode, you can create, modify, delete, and search for navigation routes.

7 **POS key**
Enters POS (position) mode. In this mode, you can display your current position, navigate and display navigation information, record and display your course, and more.

8 **DISPLAY key**
Changes the display to grid, text, and course deviation. You can also display a selection menu of stored point/route names when selecting points or routes.

9 **MARK key**
Stores your current position in memory. When the key's light is on, this indicates that the unit can store your current position. When the key's light is off, this indicates that the unit cannot store your current position.

Note:
The MARK key automatically turns off when the GPS key is off. The key does not turn on unless the current position is acquired when the GPS key is turned on.

10 **ENTER key**
Selects screen items, positions, and executes functions.

11 **Directional cursor key**
Moves the cursor up, down, left, and right, to select screen items or position.

12 **RECALL key**
Cancels an entry or selection, and returns to the previous display.

13 **ZOOM (+/–) key**
Zooms in and out of maps and changes the scales of the latitude and longitude grid. Map zoom works only on map cards with variable scales.

14 **Function keys**
The function of the keys – F1 through F4 – varies, depending on displayed screens.

Display Overview

Battery warning
Displays a warning symbol when the battery needs to be replaced.

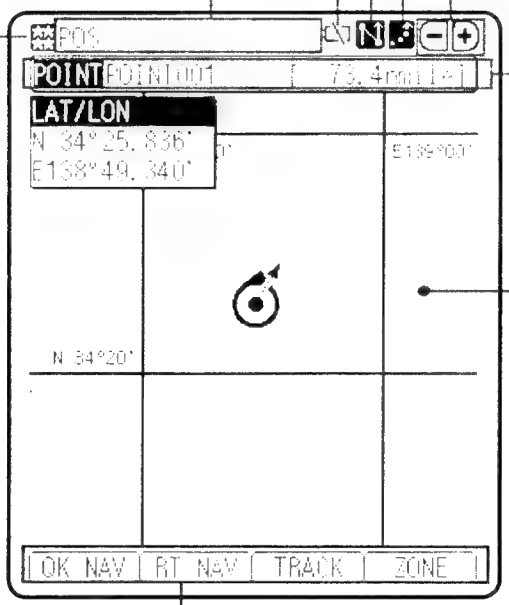
Navigation status
Displays the current navigation status as a symbol.

Track status
Displays the current course travelled (track) status as a symbol.

Map zoom indication
Displays a symbol to indicate if the map or grid can zoom in and out.

Operation mode
Displays the current operation mode as text.

Position status
Displays the position status of the GPS satellites (two- or three-dimensional position) as a symbol.



Navigation information
Displays navigation information, such as the direction and distance to the destination.

Grid display
Displays a map or grid and the navigation information graphically.

Function display
Displays the labels of the functions assigned to the keys – F1 through F4.

Precautions

To avoid possible malfunctions and to prolong the life of the unit:

- DO NOT IMMERSE IN WATER
  This product is not meant to be immersed in water or come in continuous contact with water. This product is designed to be waterproof. However, do not immerse it more than 1m (3 ft) in water.

- Do not expose the unit to excessive mechanical vibration or shock.

- Do not install the unit near strong magnets or speakers or in a dusty places.

- Do not expose the unit's LCD to:
  – Ambient temperature of more than 40 °C (104 °F) or less than 0 °C (32 °F). In very high ambient temperatures, the display may get darker. In very low ambient temperatures, the display changes slowly. (The display will return to normal under operating temperatures.)
  – High humidity. The LCD capability may deteriorate and a malfunction may occur.

- Do not put anything in the DC IN 6V jack except the recommended accessories.

- For car battery operation, use the car battery cord recommended for this unit.

- To protect the unit's memory, do not insert or remove the battery magazine or external power source, such as the car battery cord, during operation.

To maintain the unit:

- Clean the unit with a soft cloth. Do not use any type of solvent such as alcohol or benzene.

- Use a soft brush or cloth to wipe the rubber packing on the unit. Clean sand, dust, or water which can degrade the unit's water resistance.

- If any solid object or liquid fall onto the unit, disconnect the power source and have the unit checked by a Sony dealer or any Sony Service Center.

Setting Up

Overview

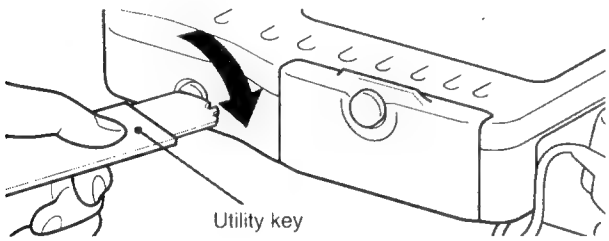
Follow these steps to set up the unit. The details of each step are on the page shown in parentheses.

1 Install the batteries (page 16)
2 Power on the unit (page 18)
3 Make the initial settings (page 18)
4 Attach the carrying strap (page 21)
5 Install the antenna (page 22)

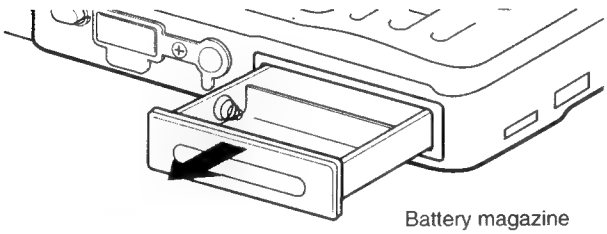
Step 1: Install the Batteries

You need six R6 (size AA) alkaline batteries. To install the alkaline batteries:

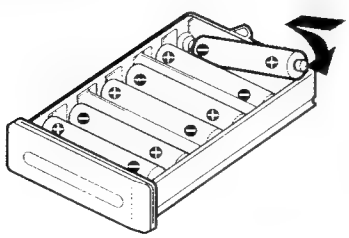
1 **Using the supplied utility key, turn the BATTERY RELEASE screw in the direction of the arrow to the "." mark until the battery magazine pops out.**



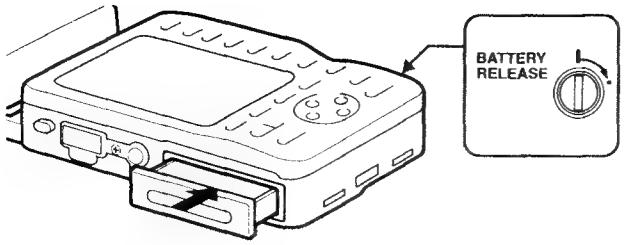
2 **Remove the battery magazine from the unit.**



3 **Insert the six R6 (size AA) alkaline batteries (not supplied), using the illustration inside the battery magazine as a guide to the correct orientation of the batteries.**



4 **Insert the battery magazine until the BATTERY RELEASE screw returns to center.**



Battery operation time

The unit can operate continuously for about four hours on six R6 (size AA) alkaline batteries and two hours when using the display's backlight. When the position update rate is set to Interval in the Position Setting menu, the unit can operate for about ten hours on alkaline batteries (see page 72).

Note:
In low ambient temperatures, batteries discharge faster.

Replacing batteries

When the batteries are discharged, the symbol "" (battery warning display) and the message "Warning! Battery low" appear in the display. When these appear, have new alkaline batteries ready for replacement. If the batteries are completely discharged, the message "Battery empty! Turn off power and replace battery" appears, and the unit automatically powers off in about 20 seconds. Only the ENTER key works before the unit powers off. Therefore, press the ENTER key when this message appears.

Note:
Use alkaline batteries: non-alkaline batteries will not last as long.

Extending the battery life

Certain functions, such as backlighting and beeps, cause the batteries to discharge faster. To extend the battery life, keep the use of these functions to a minimum.

Note:
Sometimes, using one of these functions may cause a temporary drop in voltage and the message "Warning! Battery low" may be displayed. However, the voltage is probably sufficient for normal operation.

About the lithium batteries

The unit has two built-in lithium batteries. One battery supplies power for memory, which stores navigation points and routes. The other battery supplies power for the antenna, which stores the satellite information. These lithium batteries last about five years. When they are discharged, the message "Internal lithium battery low" appears. In this case, have the batteries replaced by a Sony dealer or any Sony Service Center.

Note:
When you have the lithium batteries replaced, the unit will take about 20 minutes (or more than one hour depending on the reception condition) to acquire the current position in order to receive the orbital information for all satellites.

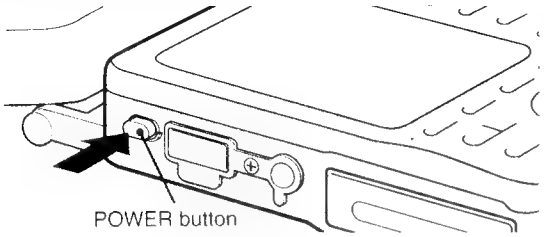
Using other power sources

You can also power the unit using the following optional accessories:
- Rechargeable battery pack (not supplied)
- Car battery, using an optional Sony adaptor

For details on these power sources, see "Using Optional Accessories" on page 79.

Step 2: Power On the Unit

To power on the unit, press the POWER button.
The unit turns on and the title screen appears.



To power off the unit, press the POWER button.
Once you have acquired your current position, the last screen displayed in POS mode appears the next time you power on the unit.

When powering on the unit again
The next time you power on the unit, the unit resumes the following functions that are performed before powering off the unit.
- The menu settings
- Route Navigation, Quick Navigation, and tracking
- The LIGHT key
- The GPS key (always turns on when the unit powers on)

To use the display's backlight, press the LIGHT key. To turn off the backlight, press the key again. To conserve the batteries, keep use of the backlight to a minimum.

To adjust the contrast:
- Increase the contrast by pressing the ↑ key simultaneously with the RECALL key. Decrease the contrast by pressing the ↓ key simultaneously with the RECALL key.
- Use the Screen Contrast option in the System Setting menu (see page 78).

Notes:
- The Memory Device option in the System Setting menu is always set to "Unit" when the unit powers on.
- When you were using the cards before powering off the unit, insert the same cards again. If no cards are inserted or the different cards are inserted, the unit cannot resume Route Navigation. Quick Navigation, or tracking.
- If you move the unit for more than seven degrees with the power turned off, the unit cannot resume tracking.

Step 3: Make Initial Settings

To make the initial settings:

1 Select the language (page 19)
2 Specify your approximate position (page 19)
3 Select the time difference between local time and UTC (Universal Time Coordinated) (page 19)
4 Select the Geodetic System (page 20)

Step 3A: Select the language

When you are using the unit for the first time, a list of languages appears. The default setting is "English."

From the list of languages, choose the language you want to use with the ↑ ↓ key, then press the ENTER key.

If you have selected the wrong language

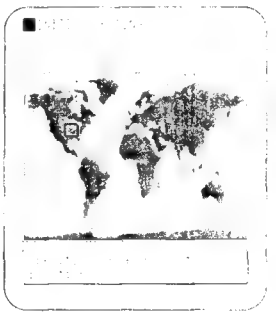
Follow the procedure below to select the correct language:

1 Press the POWER button to turn off the unit, then press the POWER button again to turn on the unit.
2 Press the MENU key.
3 Press the ↓ key seven times.
4 Press the ENTER key.
5 Press the ENTER key again.
6 Choose the language you want to use using the ↑↓ key.
7 Press the F2 key.
8 Press the F1 or RECALL key.

Step 3B: Specify your approximate position

The default setting is Kansas City (latitude 40 degrees North and longitude 95 degrees West).

Specify your approximate position with the □ cursor using the directional cursor key, then press the ENTER key.



Notes:

- When the unit receives the GPS satellites before setting your current position, the received position is automatically set to your current position.
- If your current setting deviates from the specified position more than 2,000 km (1,250 miles), it make take approximately 20 minutes to receive the GPS satellites.

Step 3C: Select the time difference

GPS employs UTC time. To set the time display to local time, you have to set the time difference between local time and UTC time. The default setting is "0:00." The time difference chart is provided on page 83, including names of cities.

To set the time difference, adjust the time difference between local time and UTC time using the ← → key, then press the ENTER key.

You can set the time difference in 15 minute intervals.

When your local time uses Daylight Saving Time, press the F1 key (DST) before pressing the ENTER key.

Step 3D: Select the Geodetic System

You must set the appropriate Geodetic System so the unit can display coordinates that correspond to the map or chart you may be using. The default setting is "WGS 84." A list of the available Geodetic Systems is provided on page 84.

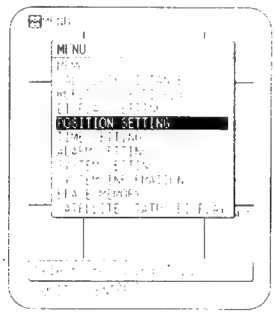
To select your Geodetic System:

Note:
When you use a commercially available map card or point database card, the Geodetic System is automatically set to the one employed on the card.

1 **Press the MENU key.**

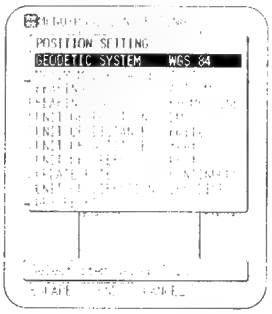
The menu appears.

2 **Choose POSITION SETTING from the menu using the directional cursor key, then press the ENTER key.**



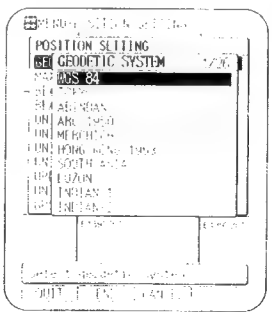
The Position Setting menu appears.

3 **Choose GEODETIC SYSTEM from the Position Setting menu using the directional cursor key, then press the ENTER key.**



A list of the Geodetic Systems appears.

4 **Choose the Geodetic System from the list using the directional cursor key, then press the ENTER key.**



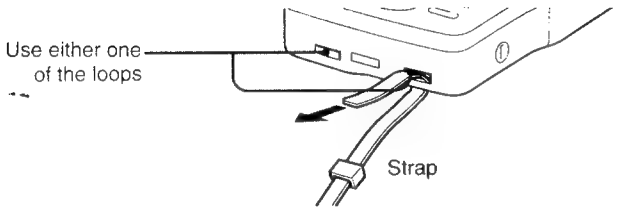
After you have set up the unit as described in this chapter, you are ready to begin using the unit. Chapter 2, "Getting Started With the Unit," describes how to get started using the IPS-760. Chapter 3, "Customizing the Unit," describes how to change the unit's default setting to suit your individual needs.

Step 4: Attach the Carrying Strap

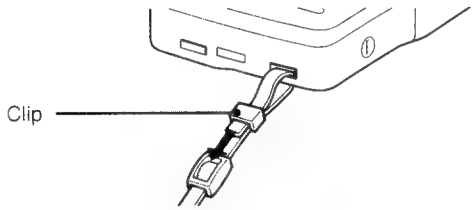
(You can skip this step if you do not want to attach the carrying strap.) The bottom of the unit has two loops for attaching the carrying strap (supplied). When carrying the unit, place the carrying strap around your hand to prevent accidentally dropping the unit.

To attach the carrying strap:

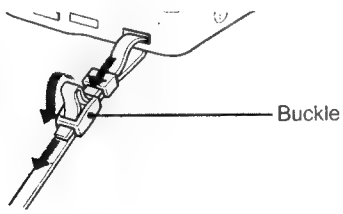
1 **Thread the strap through the loop on the bottom of the unit.**



2 **Thread the strap back through the clip.**



3 **Thread the end of the strap through the buckle, then pull the strap tight.**



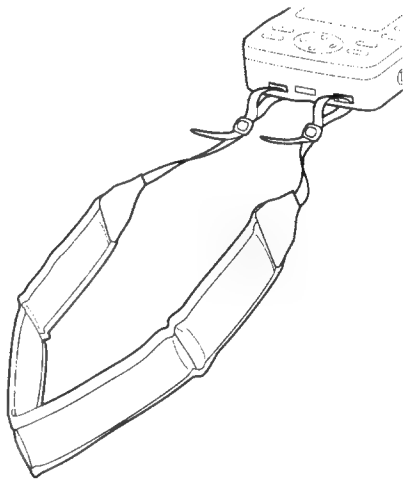
Using the carrying case

You can keep the carrying strap in the carrying case (supplied). To use the carrying case with the strap, attach the strap to the unit first, then insert the unit into the case.

Attaching the floating belt

When using the unit at sea or on river, we recommend that you attach the floating belt (supplied) instead of the carrying strap. Before attaching the belt, thread the spare utility key (supplied).

You can also use the belt as a shoulder belt.



Floating belt

Step 5: Install the Antenna

This section explains how to remotely install the antenna on your boat, car roof, or wherever you plan on using the unit.

The antenna is detachable from the unit, so you can install the antenna and the keyboard unit separately. Using the antenna extension cable (supplied), you can place the antenna up to three meters (ten feet) from the unit.

To install the antenna and display/keyboard unit:

1 Determine the location for the antenna (page 22)
2 Disconnect the antenna from the unit (page 22)
3 Replace the antenna cable with the antenna extension cable (page 23)
4 Install the antenna remotely (page 24)

To help install the antenna and the display/keyboard unit, several optional accessories are available, such as the MAK-IPS76 mount kit and the EXC-IPS7 antenna extension cable (7 m or 23 ft length).

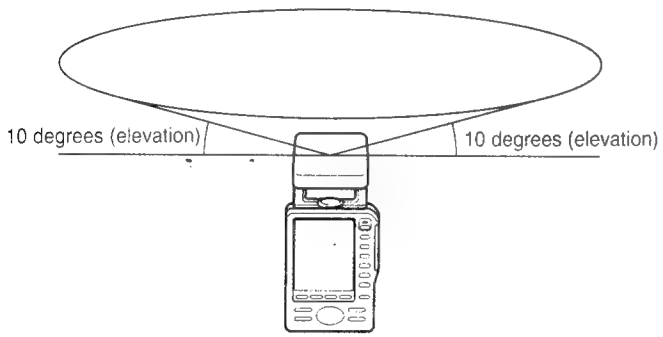
Note:
Turn off the unit before installation.

Note:
The unit uses an integrated antenna and receiver, which cannot be substituted with antennas or cables from the Sony IPS-360 or other manufacturers.

Step 5A: Determine the location for the antenna

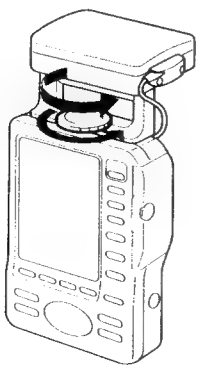
To ensure the best possible satellite reception, position the antenna horizontally, with no line-of-sight obstructions (see the figure below). The fewer obstructions, the better the unit can receive the satellite signals.

Note:
You cannot receive the GPS satellite signals indoors.



Step 5B: Disconnect the antenna

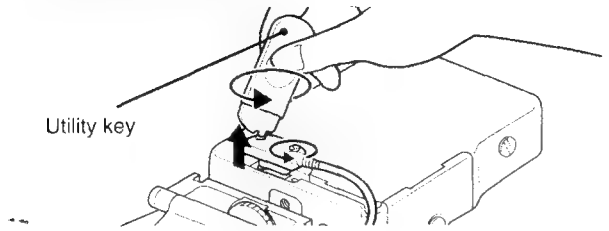
To disconnect the antenna from the unit, loosen the screw first, then remove the antenna.



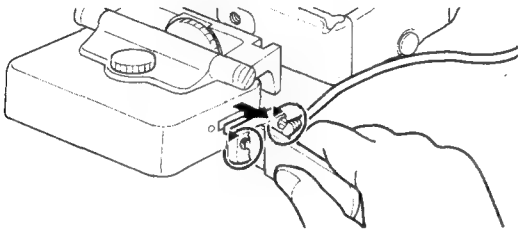
Step 5C: Replace the antenna cable

To replace the antenna cable with the antenna extension cable (supplied):

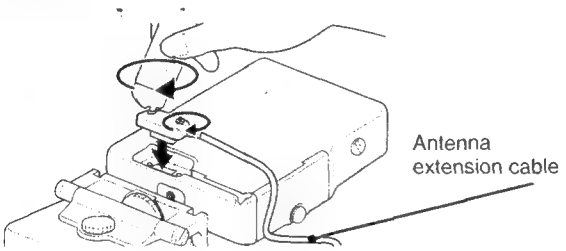
1 **Loosen the display/keyboard-side connector using the utility key (supplied), then remove the cable.**



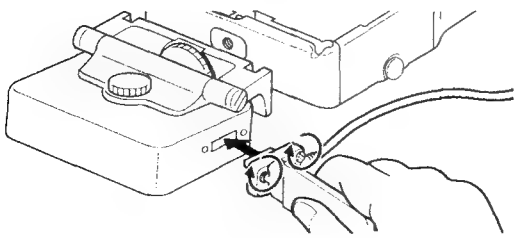
2 **Loosen the antenna-side connector using the utility key, then remove the cable.**



3 **Connect the antenna extension cable to the antenna-side connector, then tighten the screw using the utility key.**



4 **Connect the other end of the antenna extension cable to the display/keyboard-side connector, then tighten the screw using the utility key.**



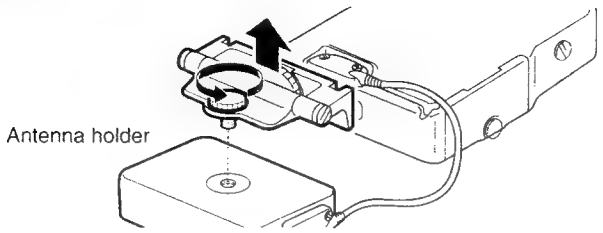
Notes:

- Make sure the antenna cable is firmly connected to the display/keyboard and to the antenna. Make sure the cable is properly seated in the grommet to preserve the water-resistance of the unit.
- If you turn on the unit and the antenna is disconnected, the message "Antenna disconnected" is displayed. When displaying your current position or navigating, check connection of the antenna cable, then press the GPS key to turn on the antenna.

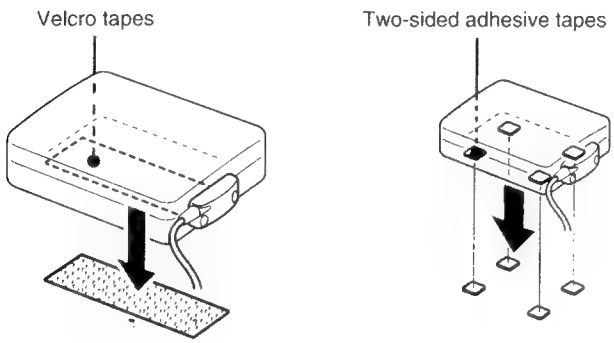
Step 5D: Install the antenna remotely

To install the antenna remotely:

1 **Loosen the screw, then remove the antenna holder from the rear of the antenna.**



2 **Attach the velcro tapes (supplied) or two-sided adhesive tapes (supplied) to the surface of the installation location and the rear of the antenna.**



Use the velcro tapes when you want to make the antenna detachable from the surface of the installation location. Use the two-sided adhesive tapes for a more permanent installation.

Notes:

- To use the tapes in the optimum condition, leave the antenna for more than 24 hours before starting to use the unit.
- When removing the antenna, detach the tapes slowly.

Operation Mode Overview

The following table is an overview of the operation modes of the unit. The details of each procedure are on the page shown in parentheses.

Mode	Description	Function
POS	POS mode provides information on your current position, navigates from your current position to your destination, records tracks, and specifies zones.	• Displaying Your Current Position (page 29) • Navigating to Your Destination (page 41) • Route Navigation (page 45) • Recording Tracks (page 48) • Displaying Tracks (page 50) • Searching for Tracks (page 51) • Modifying Track Names (page 52) • Deleting Tracks (page 52) • Setting Zones (page 53) • Displaying Zones (page 54) • Releasing Zones (page 55)
POINT	POINT mode manipulates navigation points: create, modify, delete, and search for navigation points.	• Creating New Points (page 33) • Searching for Points (page 35) • Modifying Points (page 36) • Deleting Points (page 36)
ROUTE	ROUTE mode manipulates navigation routes: create, modify, delete, and search for navigation routes.	• Creating New Routes (page 37) • Searching for Routes (page 39) • Modifying Routes (page 40) • Deleting Routes (page 40)
MARK	MARK mode stores the current position in memory.	• Storing Your Current Position (page 32)
CARD	CARD mode manipulates the IC memory card operation, such as storing data onto the card and copying the card's data to the unit.	• Displaying the Card Information (page 64) • Storing Data onto Cards (page 65) • Loading Data from Cards (page 66) • Copying Data from a Card to Another Card (page 67) • Initializing Cards (page 68) • Using Applications (page 69)
MENU	MENU mode displays the menu screen to make various system settings, display the satellite status and memo, calculate the distance, etc.	• Measuring Your Course Length (page 56) • Displaying a Point Memo (page 57) • Displaying the World Clock (page 58) • Displaying the System Information (page 59) • Initializing the Unit's Memory (page 60) • Displaying the Satellite Status (page 61) • Setting the Display (page 70) • Setting the Positioning Conditions (page 72) • Setting the Clock (page 74) • Setting the Alarms (page 75) • Changing the System Settings (page 78)

Using the Display and Keys

This section describes basic techniques for using the IPS-760's display and keys.

The functions and commands of the IPS-760 are organized into the various menu screens and function keys. Following the guidance messages that appear on the display, use the menu screens or function keys to operate the unit.

The methods for specifying positions and entering letters and numbers are also described here.

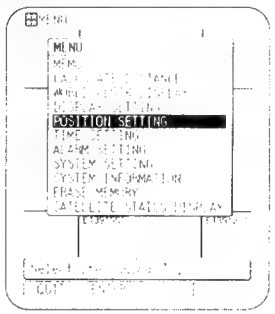
Selecting

To execute a function or command, you select it from the display. To select, press the directional cursor key until your selection is highlighted, then press the ENTER key.

Using Menus

Use the menu screens to select menu items.

To	Press
Choose an item	↑↓ key
Enter the item	ENTER key
Cancel the menu screen	RECALL key
Turn to the next page	→ key
Turn to the previous page	← key

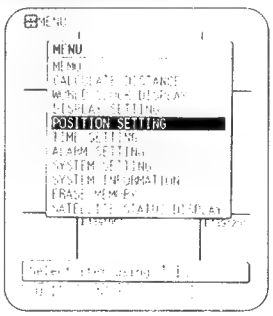


In this manual, the word "choose" means to highlight an item using the directional cursor key, and then press the ENTER key to enter the selection.
For example, "choose Position Setting from the menu" means "choose Position Setting from the menu using the directional cursor key, then press the ENTER key."

Using Function Keys

When descriptions of the function keys are shown at the bottom of the screen, this indicates that the key is "active" and that you can use it. Each function may vary depending on the screens.

To cancel the current function, press the F1 key (QUIT).



Note:
The function key labelled "ENTER" works the same as the ENTER key.

Specifying Positions

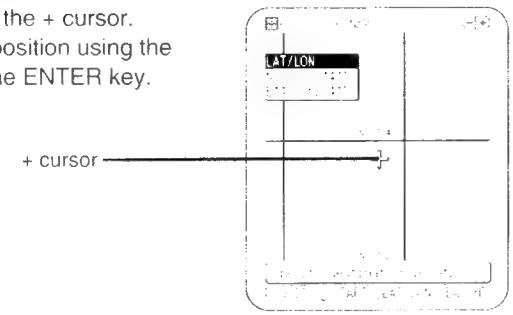
When creating navigation points and routes, and specifying destination points, you must specify positions.

You can specify positions using any of the following methods:
- Specifying a point on the grid using the + cursor
- Selecting a point that is already stored in the unit or the IC memory card from the point list
- Entering a point's latitude and longitude data

Instructions for each method follow.

Specifying a point using the + cursor

To specify a point on the grid using the + cursor, move the + cursor to your desired position using the directional cursor key, then press the ENTER key.



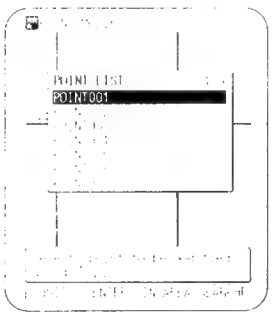
When you specified a point in the area where the points are crowded, select the point from the point list.

Note:
When you use a map card or commercially available point database card, the Geodetic System is set to the one employed on the card.

Selecting a stored point from the point list

To display the point list, press the DISPLAY key. Pressing the DISPLAY key again returns to the grid display.

To select a stored point from the point list, select the desired point using the directional cursor key, then press the ENTER key.



To	Press
Choose a point	↑ ↓ key
Enter the selection	ENTER key

Notes:
- You can also select a stored route from the route list and a stored track from the track list using this method.
- When a point's Geodetic System is different from the one used by the unit, the point is shown on a tinted background.

When you want to see the point list in which only the points in the displayed area are included, press the F3 key (IN AREA). To display the point list in which all the points are included, press the F3 key (ALL) again.

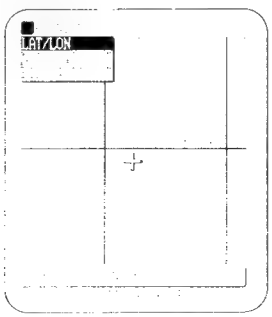
Entering latitude and longitude data

To start entering a point's latitude and longitude data, press the F3 key (LAT/LON). Pressing the F3 key (+CURSOR) again returns to the grid display.

To select the position or digit to enter data, move the cursor using the ← → key.

To enter data, select numbers using the ↑ ↓ key.

When you have finished entering data, press the ENTER key or press the F2 key (ENTER).



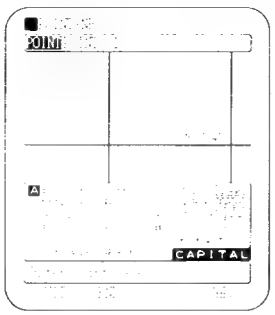
To change the direction of latitude to north (N) or south (S) or longitude to east (E) or west (W):
1. Move the cursor to N (S) or E (W) using the ← → key.
2. Change the character to the desired direction using the ↑ ↓ key.

Note:
You can also enter the magnetic variation in the Position Setting menu and distances in the Alarm Setting menu using this method.

Entering Letters and Numbers

You can enter names and memos for the data you stored in the unit or IC memory card.

To enter names and memos, use the table of keys.



To enter names for tracks and points stored with the MARK key, press the F4 key (INPUT) to display the table of keys.
When entering names for new points and routes and point memo, the table of keys automatically appears.

When creating a point or route, recording a track, or storing a current position, a temporary name, such as "POINT 001," is automatically assigned. To enter a new name, first select "Clear" from the table, then press the ENTER key. The temporary name is deleted.

To enter letters and numbers, select the character from the table using the directional cursor key, then press the ENTER key.

To move the position to enter letters or numbers, move the cursor by selecting the directional arrows from the table, then press the ENTER key.

To change the characters of the table to lowercase or uppercase, press the F4 key (CAPS) to change the mode between "CAPITAL" and "SMALL."

When you have finished entering letters or numbers, press the F2 key (END).

To cancel entering names or memos, press the F1 key (QUIT).

Notes:

- When entering memos, you can change paragraphs by selecting "Return" from the table, then press the ENTER key.
- You can enter up to 24 characters for a point/route/track name and up to 255 characters for a point memo.
- You cannot modify names and memos that are entered in Japanese language mode.

Determining Your Current Position

When you power on, the unit automatically acquires your current position. You can store this position in memory.

Displaying Your Current Position

To display your current position, press the POS key.

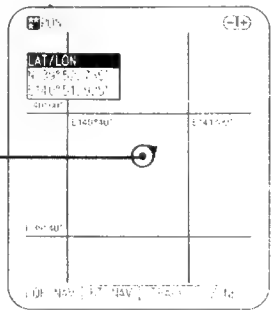
The unit enters POS mode, which lets you display your current position, including latitude, longitude, and altitude.

You can display your current position in three ways: Grid, Text, and Course deviation.

To change the display, press the DISPLAY key.

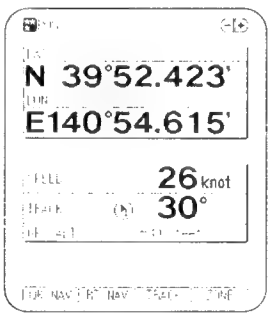
Note:
Due to the GPS specifications, the accuracy of track course and velocity is degraded if your velocity is less than 5 km/h (3 mph or 2.7 knots). Therefore, to ensure safety, the unit does not display track course and velocity when your velocity is less than 5 km/h. The accuracy of altitude is also degraded due to the GPS specifications.

- **Grid display:** Displays a grid (when an IC memory card storing map data is inserted, a map is displayed instead). The current position is centered on the grid.

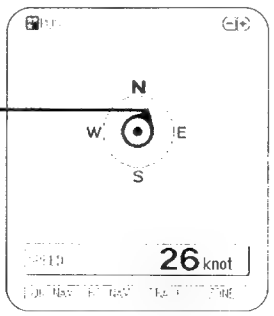


Note:
Because the unit employs the equidistant cylindrical projection, some deformation of shape towards the poles can be seen in the grid display. When the latitude is more than 70 degrees North or South, the grid display is not used due to the considerable deformation of shape.

- **Text display:** Displays your current position's data, including latitude, longitude, and altitude.



- **Course deviation display:** Displays direction to the destination and track while navigating to your destination.



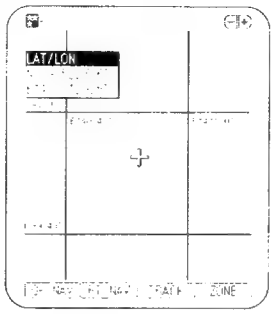
Scrolling the grid

To scroll the grid:

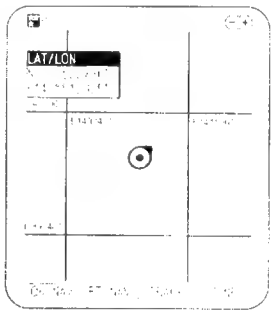
1 **Press the directional cursor key.**

The + cursor appears.

2 **Press the directional cursor key in the direction of your destination.**



To return the screen to your current position after scrolling, press the POS key.



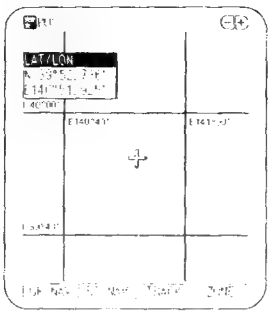
The symbol for displaying your current position changes from the + cursor to the current position mark.

Zooming in/out

You can change the scale of the grid by zooming in and out of the display. Map zoom works only on map cards with variable scales.

To zoom in, press the ZOOM (+) key.

To zoom out, press the ZOOM (–) key.



Scales of the latitude/longitude grid are as follows:

Scale	Grid interval
1/50000	1 minute
1/200000	4 minutes
1/500000	10 minutes
1/1000000	20 minutes
1/3000000	1 degree

If you cannot acquire your current position

Check the following:
- The GPS key is turned on (the GPS key is lit) (see page 13).
- The antenna is in a location with no obstructions (see page 22).

You can also display the satellite status to check the satellite allocation (see page 61).

Storing Your Current Position

You can store your current position, such as latitude and longitude, at any time the unit is acquiring signals from the satellites, regardless of which mode the unit is in. This data is stored in memory as a point, which you can use for navigation.

To store your current position:

1 **Press the MARK key.**

The unit stores your current position, and assigns a temporary name for that point, such as "MARK001." To use the temporary name, press the ENTER key (you do not have to perform steps 2 through 4). The screen that was displayed before pressing the MARK key appears. To change the temporary name, go to step 2.

2 **Press the F4 key (INPUT) to enter the point name.**

3 **Enter the point name.**

4 **Select the point icon.**
To display the next page of the point icon menu, press the F4 key (MORE).

To cancel storing your current position, press the F1 key (QUIT).

To change the temporary name of a stored point, modify the point name in POINT mode. See "Modifying Points" on page 36.

You can also enter additional data about the point, such as the point type. You can also create notes about a point. See "Modifying Points" on page 36.

Note:
To store your current position, the unit must first have a current position calculated (that is, it must be receiving GPS signals from at least three satellites).

Note:
To enter letters and numbers, refer to "Entering Letters and Numbers" on page 28.

Note:
You cannot store your current position if:
- The GPS key is turned off.
- The position is not updated for more than 20 seconds.
- The position update rate is set to Interval.

If you cannot store your current position

Check the following:
- The GPS key is turned on (the GPS key is lit) (see page 13).
- The position update rate is set to Continuous in the Position Setting menu (see page 72).

Creating Navigation Points

This section explains how to create and edit navigation points.

You can save position information for navigation using several methods: specifying the position on the map, inputting the latitude and longitude data, or by just storing your current position. This position information is known as a "navigation point" or, more simply, a "point."

In POINT mode, you can create, modify, delete, and search for points.

To enter POINT mode, press the POINT key.

Note:
Before selecting the function in POINT mode, you can display the point memo by selecting the point name and pressing the ENTER key in the point list.

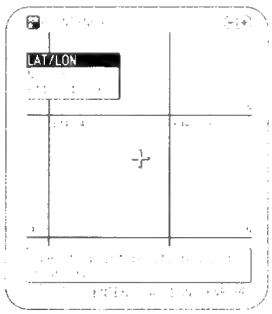
Creating New Points

When you create a new point, you can assign names and icons to each point so you can easily indentify that point when navigating.

To create a new point:

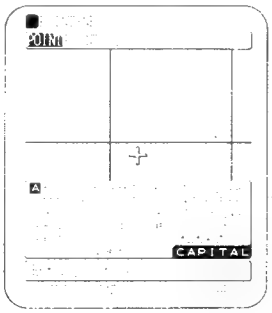
1 **Press the F1 key (NEW).**

2 **Specify the position.**



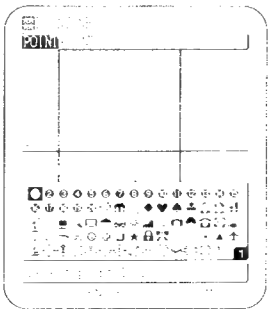
Note:
To specify a point, refer to "Specifying Positions" on page 27.

3 **Enter the point name.**



Note:
To enter letters and numbers, refer to "Entering Letters and Numbers" on page 28.

4 **Select an icon for the point.**
To display the next page of the point icon menu, press the F4 key (MORE).



To cancel creating a new point, press the F1 key (QUIT).

Entering the point type and memo

You can also enter additional data about the point, such as the point type. You can also create notes about a point. See "Modifying Points" on page 36.

If the memory is full

When you create a point, the point's data is stored in memory – in the unit's memory or in the IC card's memory – whichever device you have specified. If the message "Insufficient memory" appears, this indicates that the device's memory is full, which means that you will not be able to save the point until additional memory is made available. To make more memory available for the point, first check the unit's memory by choosing System Information from the menu. Then either delete any unneeded data (points, routes, etc.) from memory, or move data from the unit's memory to an IC card's memory. To delete data from the unit, see "Deleting Points" on page 36, "Deleting Routes" on page 40, "Deleting Tracks" on page 52, and "Releasing Zones" on page 55. For more information on using IC memory cards, see "Using IC Memory Cards" on page 62.

Note:
When storing data onto an IC memory card, choose the appropriate card from the Memory Device option in the System Setting menu.

Searching for Points

The following search methods are available to search for points.You can assign multiple methods.

Memory: Selects the memory device in which a point to be searched for is stored.

Type: Searches for a point by the point type. A table of the available point types is provided on page 86.

Icon: Searches for a point by the point icon.

Text: Searches for a point by the point name that begins with the assigned text.

Criteria: Releases all the search criteria that are currently assigned.

To search for a point:

1 **Press the F4 key (SEARCHP).**

2 **Select the search method.**

3 **Select the search item.**

When you have finished selecting the search methods and items, press the RECALL key.

To cancel searching for a point, press the F1 key (QUIT).

To release the current search criteria:
1 Preses the F4 key (SEARCHP).
2 Choose DELETE CRITERIA from the Search menu.
3 Choose YES to release the criteria.

Note:
You can only set one item for each search method.

Modifying Points

You can modify names, icons, and the position of points. You can also enter additional data about the point, such as the point type, and notes about the point.

To modify a point:

1 **Press the F2 key (MODIFY).**

2 **Specify the point to modify.**

3 **Select the item to modify.**

4 **Modify the selected item.**

Certain point types are classified into one or two detailed categories. If you want to stop selecting the categories, press the F2 key (FNL ENT). A table of the available point types is provided on page 86.

To cancel modifying the point, press the F1 key (QUIT).

Note:
When you modify the position of a point that is used in a route, a new point is created in the modified position, and all the data are transferred to the new point. Therefore, you do not have to modify the route.

Deleting Points

To delete a point:

1 **Press the F3 key (DELETE).**

2 **Specify the point to delete.**

3 **Choose YES to delete the selected point.**

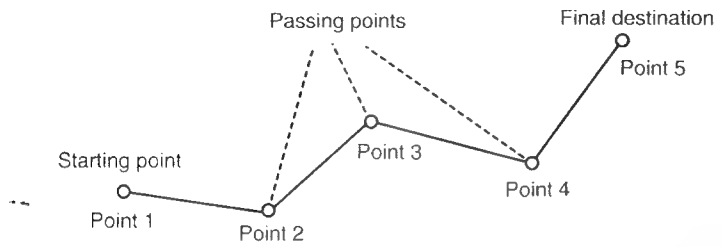
To cancel deleting a point, press the F1 key (QUIT) or choose NO in step 3.

Note:
You cannot delete points that are used in a route. First modify or delete the route and then delete the point from the route.

Creating Navigation Routes

This section explains how to create and edit navigation routes.

To create a route, you can use the navigation points that you have already stored in the unit or the IC memory cards. First plan your route from the starting point, followed by the passing points and the final destination (see the figure below).



In ROUTE mode, you can create, modify, delete, and search for routes.

To enter ROUTE mode, press the ROUTE key.

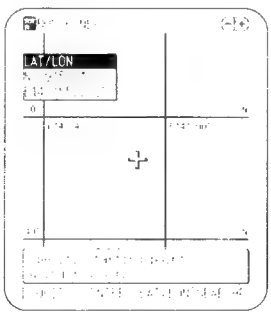
Creating New Routes

You can create new navigation routes. When you create a route, you can assign it a route name. A route can hold up to 99 navigation points.

To create a new route:

1 **Press the F1 key (NEW).**

2 **Specify the starting point.**

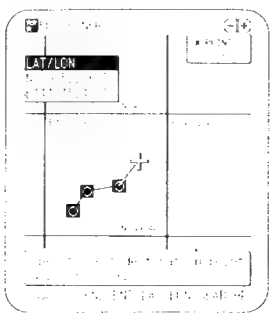


Note:
To specify a point, refer to "Specifying Positions" on page 27.

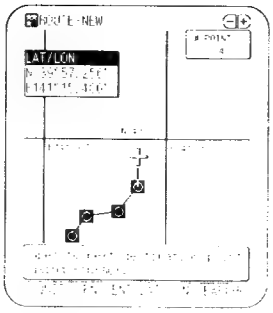
3 **Specify the passing points consecutively. Finally specify the destination point.**

The number of points in the route is displayed on the screen.

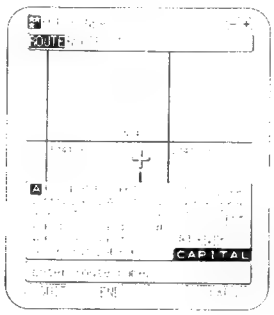
To continue specifying the next point, press the ENTER key.
To specify the previous point, press the RECALL key.



4 **After specifying the destination point, press the F2 key (FNL ENT).**



5 **Enter a name for the route.**



Note:
To enter letters and numbers, refer to "Entering Letters and Numbers" on page 28.

To cancel creating a new route, press the F1 key (QUIT).

If the memory is full

When you create a route, the route's data is stored in memory – in the unit's memory or in the IC card's memory – whichever device you have specified. If the message "Insufficient memory" appears, this indicates that the device's memory is full, which means that you will not be able to save the route until additional memory is made available. To make more memory available for the route, first check the unit's memory by choosing System Information from the menu. Then either delete any unneeded data (points, routes, etc.) from memory, or move data from the unit's memory to an IC card's memory. To delete data from the unit, see "Deleting Points" on page 36, "Deleting Routes" on page 40, "Deleting Tracks" on page 52, and "Releasing Zones" on page 55. For more information on using IC memory cards, see "Using IC Memory Cards" on page 62.

Note:
When storing data onto an IC memory card, choose the appropriate card from the Memory Device option in the System Setting menu.

Searching for Routes

The following search methods are available to search for routes. You can assign multiple methods.

Memory: Selects the memory device in which a route to be searched for is stored.

Text: Searches for a route by the route name that begins with the assigned text.

Criteria: Releases all the search criteria that are currently assigned.

To search for a route:

1 **Press the F4 key (SEARCHR).**

2 **Select the search method.**

3 **Select the search item.**

When you have finished selecting the search methods and items, press the RECALL key.

To cancel searching for a route, press the F1 key (QUIT).

To release the current search criteria:

1 Press the F4 key (SEARCHR).
2 Choose DELETE CRITERIA from the Search menu.
3 Choose YES to release the criteria.

Note:
You can only set one item for each search method.

Modifying Routes

You can add, move, insert, and delete points in a route, and modify route names.

To modify a route:

1 **Press the F2 key (MODIFY).**

2 **Select the route to modify.**

3 **Choose YES to modify the selected route.**

4 **Select the item to modify.**

5 **Modify the selected item.**
To add a point, specify the point to be added to the route.

To move a point:
1 Specify the point to be moved using the + cursor or from the point list.
2 Specify the new position using the + cursor or enter the latitude and longitude data of the new position.

To insert a point:
1 Pick two points in the route between which you want to insert a new point. The cursor to specify the position to insert the point moves among the points in the route. Specify the position using the cursor.
2 Specify the point to be inserted.

To delete a point, specify the point to be deleted from the route.
In the grid display, the cursor to specify the deletion of the point moves among the points in the route. Specify the point using the cursor.
In the point list, select the point from the list.

To cancel modifying a route, press the F1 key (QUIT).

Deleting Routes

To delete a route:

1 **Press the F3 key (DELETE).**

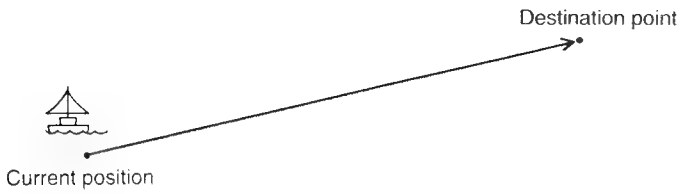
2 **Select the route name to delete.**

3 **Choose YES to delete the selected route.**

To cancel deleting a route, press the F1 key (QUIT) or choose NO in step 3.

Navigating to Your Destination

You can navigate from your current position to a destination point that you specify in POS mode. This navigation, called "Quick Navigation," is useful for navigating to short distances.



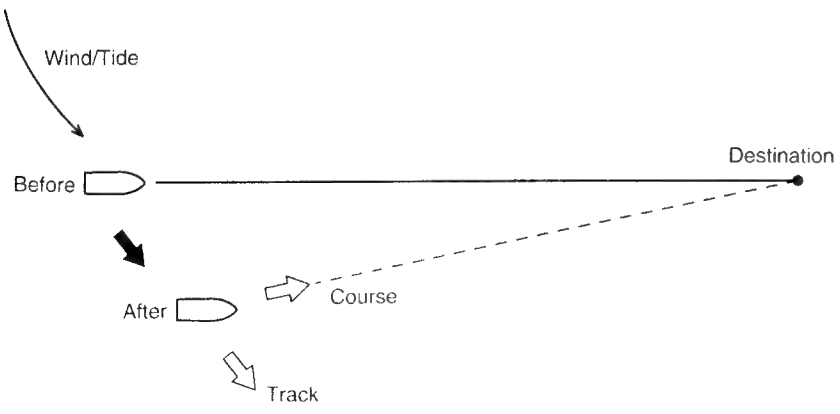
Navigation information

During Quick Navigation, the unit provides the following information:

- Track
- Course
- Distance from your current position to your destination
- Velocity
- Cross track error (course deviation indicator)
- Estimated time of arrival or estimated time enroute
- WGS84 altitude (the altitude based on the World Geodetic System 1984 coordinates)
- Latitude
- Longitude
- Destination name

Track course and true course

The unit calculates the track course and true course according to the concept illustrated below.



Unlike your compass heading, track indicates course deviations that are caused by factors such as wind, tide, and so on.

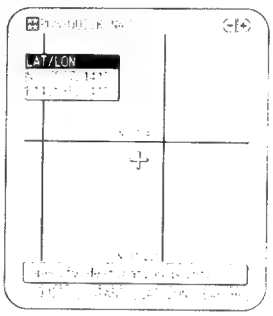
Starting Navigation

To start Quick Navigation:

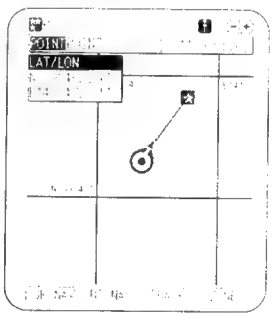
1 **Press the POS key to enter POS mode.**

2 **Press the F1 key (QK NAV).**

3 **Specify your destination point.**



4 **Press the ENTER or F2 key (START) to begin navigation.**
Navigation begins. The destination point you have specified is shown as the " ★ " mark on the grid display.



To stop navigation:
1 Press the F1 key (QK NAV).
2 Press the F1 key (QUIT).

Notes:
- Before starting navigation, make sure the latitude and longitude data is acquired.
- The unit does not store the destination point that is specified using the + cursor during Quick Navigation.

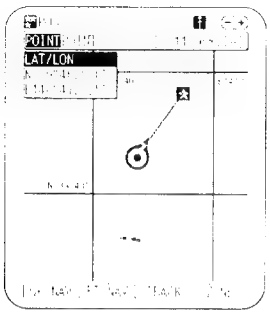
Note:
To specify your a point, refer to "Specifying Positions" on page 27.

Displaying Navigation Information

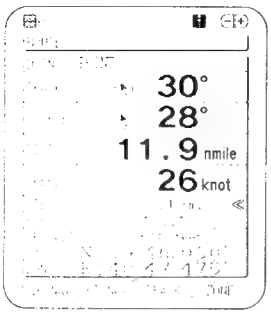
You can display navigation information in the grid, text, or course deviation display, including the cross track error display.

To change the display, press the DISPLAY key.

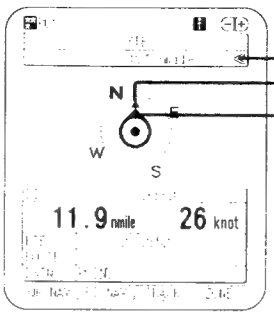
• Grid display



• Text display

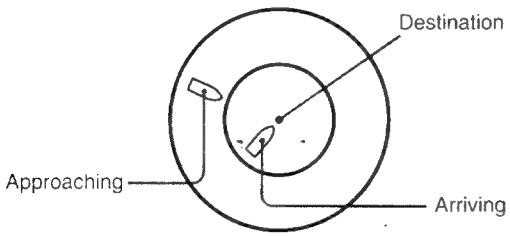


• Course deviation display



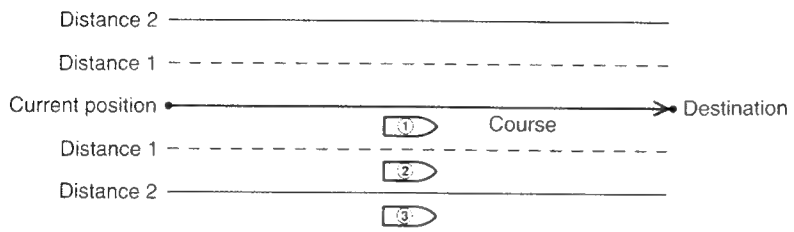
When you approach or reach your destination

The unit notifies you with an alarm and the GPS key's light flashes green and red when you approach or reach your destination.



If you deviate from your course

The unit notifies you with an alarm and the course deviation indicator. The GPS key's light flashes green and red if you deviate from your course. This indicator gives you information about the direction you are travelling in (track) versus the direction to your destination (course) so that you can check if you are heading in the right direction. This information is called "cross track error."



Check how far and which direction you deviate from your course with the following indicator:

Indicator	Meaning
1 ≪	Within the acceptable range of the course deviation (less than Distance 1)
2 ≪≪	Watch for the course deviation (greater than Distance 1 but less than Distance 2)
3 ≪≪≪	Warning! (greater than Distance 2)

Note:
The direction of the cross track error display's arrow shows the direction of the course correction to apply.

About the alarms

During navigation, you can use the following alarms:
- Destination alarm: Notifies you when approaching or reaching your destination.
- Course deviation alarm: Notifies you when deviating from your course.
- Zone alarm: Notifies you when entering a particular zone you have specified. If you want to use the zone alarm, specify the zone before you start navigation (see "Specifying Zones" on page 53).

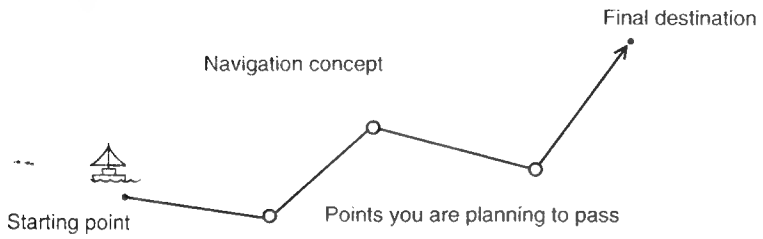
If you want to turn on/off the alarms or change the alarm settings, make the settings before you start to navigate. See "Setting the Alarms" on page 75.

Note:
When the position update rate is set to Interval in the Position Setting menu, the alarms may not function or the cross track error may not be displayed.

Route Navigation

This section explains how to plan a route and navigate to your destination using that route.

The unit can navigate to a destination via your planned route. To plan a route, you need to determine your starting point, the points you are planning to pass, and the final destination (see the figure below). This navigation is called "Route Navigation." Route Navigation is useful when travelling a long distance or a complicated route.



Navigation information

During navigation, the unit displays the following information:

- Track
- Course (direction from your current position to the passing point or final destination)
- Distance between your current position and the passing point or final destination
- Velocity
- Cross track error display (course deviation indicator)
- Estimated time of arrival or estimated time enroute
- WGS84 altitude (the altitude based on the World Geodetic System 1984 coordinates)
- Latitude
- Longitude
- Route name
- Name of the passing point

Planning Your Route

Plan your route before you start navigation.

To plan your route:

1 **Decide the destination and route using a chart, map, or map information stored on an IC memory card.**

2 **Create your route in ROUTE mode.**
→ "Creating Navigation Routes" (see page 37)

When you have finished planning and creating your route, you are ready to start navigation.

Starting Navigation

You must have at least one route created to start Route Navigation. The unit navigates from your current position to your destination.

To start navigation:

1 **Press the POS key to enter POS mode.**

2 **Press the F2 key (RT NAV).**

3 **Select the route name.**

If you want to change the direction of the route for round trip, press the F3 key (REVERSE).

4 **Select your starting point of navigation from the navigation points in the selected route.**

5 **Press the ENTER or F2 key (START) to begin navigation.**

Notes:
- Before starting navigation, make sure the latitude and longitude data is acquired.
- When you modify the navigation points in the route during navigation, the contents of the route are automatically updated.
- You cannot change the route during navigation.

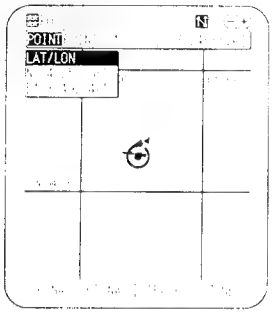
To stop navigation:
1 Press the F2 key (RT NAV).
2 Press the F1 key (QUIT).

Displaying Navigation Information

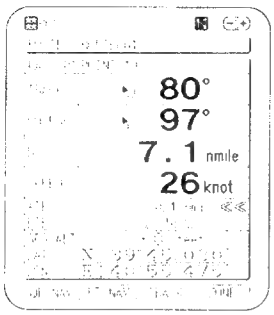
You can display navigation information in the form of a grid, text, or course deviation display, including the cross track error display.

To change the display, press the DISPLAY key.

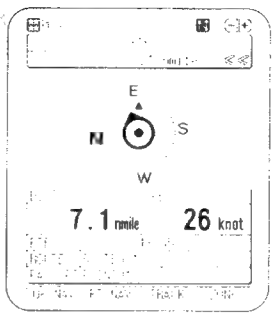
• Grid display



• Text display



• Course deviation display



When you approach or reach your destination

The unit notifies you with an alarm and the GPS key's light flashes green and red when you approach or reach your destination.

If you deviate from your course

The unit notifies you with an alarm and the course deviation indicator. The GPS key's light flashes green and red if you deviate from your course. The indicator gives you the information of the direction you are travelling in (track) versus the direction to your destination (course) so that you can check if you are heading in the right direction. This information is called "cross track error."

Check how far and which direction you deviate from your course with the indicator (see table on the right).

Indicator	Meaning
<	Within the acceptable range of the course deviation (less than Distance 1)
<<	Watch for the course deviation (greater than Distance 1 but less than Distance 2)
<<<	Warning! (greater than Distance 2)

About the alarms

During navigation, you can use the following alarms:
- Destination alarm: Notifies you when approaching or reaching your destination.
- Course deviation alarm: Notifies you when deviating from your course.
- Zone alarm: Notifies you when entering a particular zone you have specified. If you want to use the zone alarm, specify the zone before you start navigation (see "Specifying Zones" on page 53).

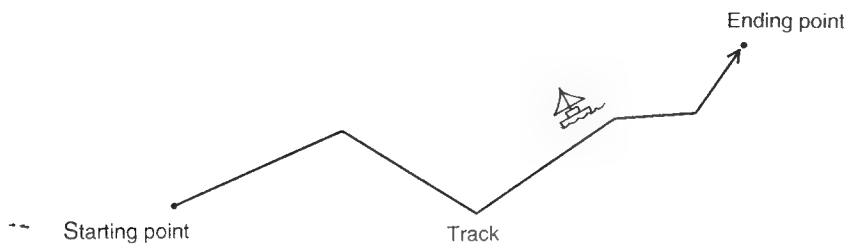
If you want to turn on/off the alarms or change the alarm settings, make the settings before starting navigation. See "Setting the Alarms" on page 75.

Notes:
- The direction of the cross track error display's arrow shows the direction of the course correction to apply.
- When the position update rate is set to Interval in the Position Setting menu, the alarms may not function or the cross track error may not be displayed.

Tracking Your Course

This section explains how to track your course travelled.

You can record and display a graphic representation and information about your trip from your starting point to your current position. The course travelled in your trip is called "track" (see figure below).



The unit provides the following information:
- Total distance from the starting point to your current position
- Direction from the starting point to your current position
- WGS84 altitude (this is the altitude based on the World Geodetic System 1984 coordinates)

In POS mode, you can track your course travelled, display and delete the track, and enter, modify, and search for track names.

To enter POS mode, press the POS key.

Recording Tracks

To record a track:

Note:
Before recording a track, make sure the latitude and longitude data is acquired.

1 **Press the F3 key (TRACK).**

2 **Choose START RECORDING from the Track menu.**

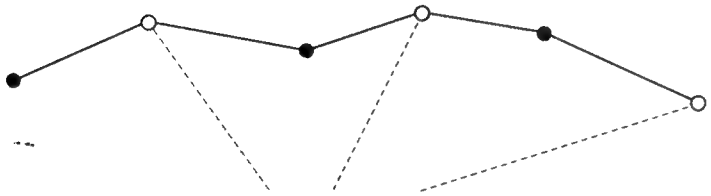
3 **Press the ENTER or F2 key (START) to start recording a track.**
The unit assigns a temporary name for the track, such as " TRACK001."
When you want to enter a track name before starting to record a track, press the F4 key (INPUT) in step 3.
Recording begins.

To stop recording the track:
1 Press the F3 key (TRACK).
2 Choose QUIT RECORDING from the Track menu.
3 Choose YES to stop recording the track.

Note:
To enter letters and numbers, refer to "Entering Letters Numbers" on page 28.

If the track is full

The unit records a point in every 50 meters of the course travelled or in every three seconds. If the number of points in the track exceeds 500, the message "Track full. Point interval is being modified in order to continue tracking" appears. When you want to continue recording the track, the unit modifies the point interval by deleting every other point so that the number of points in the track is halved. The unit then records the track at this longer interval.



Points deleted to modify the point interval

If the memory is full

When you record a track, the track's data is stored in memory - in the unit's memory or in the IC card's memory - whichever device you have specified. If the message "Insufficient memory" appears, this indicates that the device's memory is full, which means that you will not be able to save the track until additional memory is made available. To make more memory available for the track, first check the unit's memory by choosing System Information from the menu. Then either delete any unneeded data (points, routes, etc.) from memory, or move data from the unit's memory to an IC card's memory. To delete data from the unit, see "Deleting Points" on page 36, "Deleting Routes" on page 40, "Deleting Tracks" on page 52, and "Releasing Zones" on page 55. For more information on using IC memory cards, see "Using IC Memory Cards" on page 62.

Note:
When storing data onto an IC memory card, choose the appropriate card from the Memory Device option in the System Setting menu.

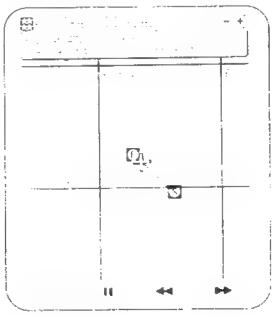
Displaying Tracks

To display the recorded track:

1 **Press the F3 key (TRACK).**

2 **Choose DISPLAY from the Track menu.**

3 **Select the track to display.**



The track is displayed.

To	Press
Stop displaying	F1 key (STOP)
Pause	F2 key (❚❚)
Display (fast backward)	Hold down F3 key (◀◀)
Display (fast forward)	Hold down F4 key (▶▶)

Searching for Tracks

You can search for tracks when selecting tracks to display, modify, and delete. The following search methods are available to search for tracks. You can assign multiple methods.

Memory: Selects the memory device in which a track to be searched for is stored.

Text: Searches for a track by the track name that begins with the assigned text.

Criteria: Releases all the search criteria that are currently assigned.

To search for a track:

1 **Press the F3 key (TRACK).**

2 **Select the function: DISPLAY, DELETE or MODIFY from the Search menu.**

3 **Press the F4 key (SEARCHT).**

4 **Select the search method.**

5 **Select the search item**

When you have finished selecting the search methods and items, press the RECALL key

To cancel searching for a track, press the F1 key (QUIT).

To release the current search criteria:

1 Press the F3 key (TRACK).
2 Select the function: DISPLAY, DELETE, or MODIFY from the Search menu.
3 Press the F4 key (SEARCHT).
4 Choose DELETE CRITERIA from the Search menu.
5 Choose YES to release the criteria.

Note:
You can only set one item for each search method.

Modifying Track Names

To modify a track name:

1 **Press the F3 key (TRACK).**

2 **Choose MODIFY from the Track menu.**

3 **Select the track to modify.**

4 **Modify the name.**

To cancel modifying a track name, press the F1 key (QUIT).

Deleting Tracks

To delete a track:

1 **Press the F3 key (TRACK).**

2 **Choose DELETE from the Track menu.**

3 **Select the track to delete.**

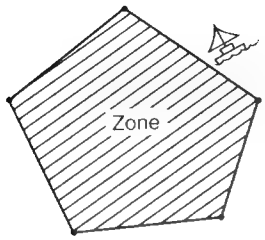
4 **Choose YES to delete the selected track.**

To cancel deleting a track name, press the F1 key (QUIT) or choose NO in step 4.

Specifying Zones

This section explains how to specify zones, which you can use to help you navigate. By setting up zones, you can use the zone alarm to alert you when you are entering a specific zone.

Note:
If you set too many zones, the response of the display may be degraded.



In POS mode, you can set, display, and release zones.

To enter POS mode, press the POS key.

To turn off the zone alarm, set the zone alarm to Off in the Alarm Setting menu (see page 75).

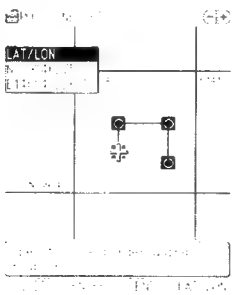
Setting Zones

To set a zone:

1 **Press the F4 key (ZONE).**

2 **Choose SET from the Zone menu.**

3 **Specify the outline points of the zone repeatedly until the zone is defined. Press the ENTER key to make the selection of each point.**
To continue specifying the points, press the ENTER key.
To specify the previous point, press the RECALL key.



Notes:
- To specify a point, refer to "Specifying Positions" on page 27.
- You must specify a minimum of three points to make a zone. You can use a maximum of 20 points to make a zone and a maximum of 200 points for all zones.

4 **When you have finished making the selection of all points, press the F3 key (END) to set the zone.**

To cancel setting a zone, press the F1 key (QUIT).

If the memory is full

When you set up a zone, the zone's data is stored in memory - in the unit's memory or in the IC card's memory - whichever device you have specified. If the message "Insufficient memory" appears, this indicates that the device's memory is full, which means that you will not be able to save the zone until additional memory is made available. To make more memory available for the zone, first check the unit's memory by choosing System Information from the menu. Then either delete any unneeded data (points, routes, etc.) from memory, or move data from the unit's memory to an IC card's memory. To delete data from the unit, see "Deleting Points" on page 32, "Deleting Routes" on page 40, "Deleting Tracks" on page 52, and "Releasing Zones" on page 55. For more information on using IC memory cards, see "Using IC Memory Cards" on page 62.

Note:
When storing data onto an IC memory card, choose the appropriate card from the Memory Device option in the System Setting menu.

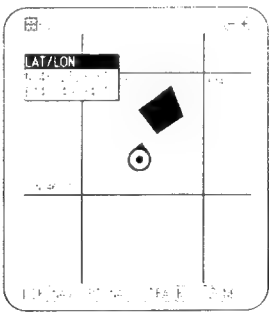
Displaying Zones

To display specified zones:

1 **Press the F4 key (ZONE).**

2 **Choose DISPLAY from the Zone menu.**

3 **Choose ON to display zones.**



The zone is displayed.

If you do not want to display zones, choose OFF in step 3.

To cancel displaying zones, press the F1 key (QUIT).

Releasing Zones

To release the setting of a zone:

1 **Press the F4 key (ZONE).**

2 **Choose DELETE from the Zone menu.**

3 **Select the zone using the + cursor.**

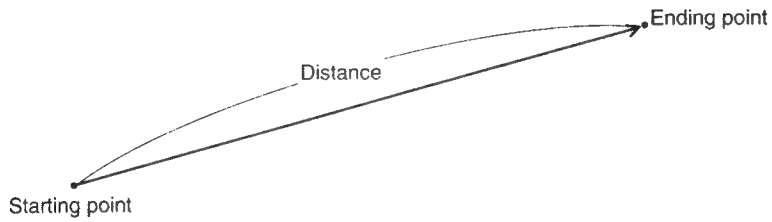
4 **Choose YES to release the setting of the selected zone.**

To cancel releasing the setting of a zone, press the F1 key (QUIT) or choose NO in step 4.

Measuring Your Course Length

This section explains how to measure your course length.

The unit can measure the distance between two positions (see the figure below):
- From a point to a point
- From a point to the + cursor's position
- From the current position to a point
- From the current position to the + cursor's position



The unit calculates the distance based on the method that is set in the Bearing Calculation option from the Position Setting menu. See page 72 for details.

To measure the distance:

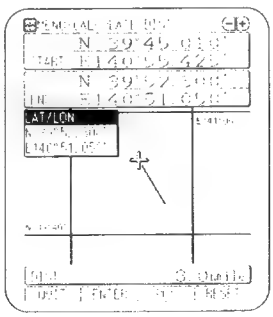
1 **Press the MENU key to enter MENU mode.**

2 **Choose CALCULATE DISTANCE from the menu.**

3 **Specify the starting point of the distance.**
To move the + cursor to your current position, press the F3 key (POS).

Note:
To specify a point, refer to "Specifying Positions" on page 27.

4 **Specify the ending point of the distance.**
The distance is calculated and displayed.



To continue calculating the distance, repeat step 4.

To calculate a different distance, first press the F4 key (RESET), then repeat steps 3 and 4.

To cancel measuring the distance, press the F1 key (QUIT).

Displaying a Point Memo

This section explains how to display a point memo, such as notes about a point.

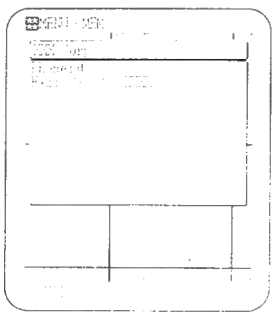
In POINT mode, you can enter a memo for each point you created (see page 36). You can display this memo from the menu.

To display a point memo:

1 **Press the MENU key to enter MENU mode.**

2 **Choose MEMO from the menu.**

3 **Select the point whose memo you want to display.**
Memo is displayed.



To cancel the memo display, press the F1 key (QUIT).

Displaying a Point Memo in POINT mode

You can display a point memo by selecting a point from the point list or directly specifying a point from the grid display in POINT mode.

To display a point memo:
1 Press the POINT key to enter POINT mode.
2 Select a point from the point list, or specify a point from the grid display using the + cursor.
3 Press the ENTER key.

Displaying the World Clock

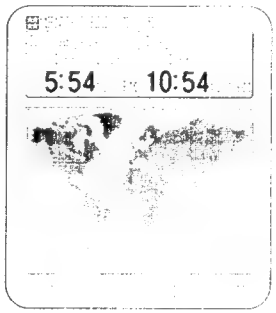
This section explains how to display the world clock.

You can display the local time of major cities in the world using the world clock. For details on the locations and time differences of the cities in the world clock, see "Time Difference Chart" on page 83.

To display the world clock:

1 **Press the MENU key to enter MENU mode.**

2 **Choose WORLD CLOCK DISPLAY from the menu.**
The world clock, which shows local times of two cities, is displayed.



To change the cities in the world clock:

1 Press the F3 or F4 key (CHGCITY).
To change the city displayed on the left in the world clock, press the F3 key.
To change the city displayed on the right in the world clock, press the F4 key.
2 Select the city.

To cancel the world clock display, press the F1 key (QUIT).

Note:

- When the unit is not receiving the GPS satellites, the error of the time display may increase.
- When you turn on the unit while the antenna is disconnected from the unit, the time display may change.
- Because the timing information is received from the GPS satellites, you do not need to adjust the time display's error.

Displaying the System Information

This section explains how to display the system information.

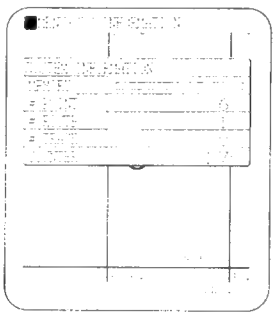
The unit can display the following system information:
- Amount of memory used
- Amount of data (points, routes, and tracks) stored in the unit
- Power counter (the counter starts when the power turns on; unit in minutes)

Use this information to check how much of the unit's memory is used.

To display the system information:

1 **Press the MENU key to enter MENU mode.**

2 **Choose SYSTEM INFORMATION from the menu.**
The system information is displayed.



About the power counter
You can check the amount of the batteries used. When you change the batteries, press the F4 key (RESET) to reset the counter. The counter returns to 0 minute and starts counting for the new batteries.

To cancel the system information display, press the F1 key (QUIT).

Initializing the Unit's Memory

This section explains how to initialize the unit's memory.

Initialize the unit's memory when you want to erase all data stored in the unit's memory. The menu settings are also erased.

To initialize an IC memory card, see "Initializing Cards" on page 68.

To initialize the unit's memory:

1 **Press the MENU key to enter MENU mode.**

2 **Choose ERASE MEMORY from the menu.**

3 **Choose YES to Initialize the unit's memory.**

To cancel initializing the unit's memory, press the F1 key (QUIT) or choose NO in step 3.

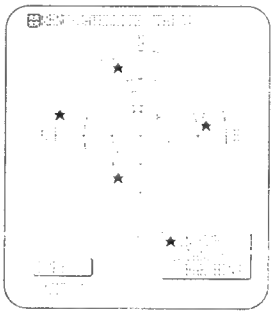
Displaying the Satellite Status

You can check the status of the satellites at any time in MENU mode. The unit automatically selects the best three or four satellites (depending on availability) to use to determine your position. By displaying the satellite status, you can determine which satellites the unit is using to calculate position, the number of satellites being used to calculate the position, and which satellites are in view. You can also check the DOP value.

To display the satellite status:

1 **Press the MENU key to enter MENU mode.**

2 **Choose SATELLITE STATUS DISPLAY from the menu.**
The satellite status display appears.



To cancel the satellite status display, press the F1 key (QUIT).

Symbols

The symbols for each satellite have the following meaning:

Symbol	Meaning
★ IN USE	The unit is using this satellite to calculate the position.
☆ STAND-BY	The unit is receiving this satellite but not using it to calculate the position.
◯ SEARCHING	The unit is searching for these satellites.

Using IC Memory Cards

This section explains how to use optional IC memory cards with the unit. For more information, see the documentation that comes with the card.

When using IC memory cards, insert the cards before powering on the unit. You can use up to two cards at a time.

Notes on usage:

- Be sure to use only cards that have the PX5 mark on it.
- Be sure to turn off the power to the unit when inserting and removing cards.
- To protect the unit's memory, do not insert or remove the battery magazine or external power source, such as the car battery cord, during operation.
- Store the card in its plastic case when you are not using it.
- Do not bend or drop cards.
- Do not expose cards to static electricity, heat, direct sunlight, moisture, or mechanical shock.
- Do not touch the card terminals with your finger. Do not place the card terminals close to metal. If the terminals are dirty, clean them with the cleaning tissue (supplied).
- If you have not used a card for a prolonged period of time, the card terminals may be dirty with rust or dust. Be sure to clean the terminals before use.
- Make a backup copy for your important data.
- When a map card or point database card is used, the Geodetic System is automatically changed to the setting the card employs.
- When two cards are inserted, Card 1 has priority over Card 2.

Note on the IC memory card slots:

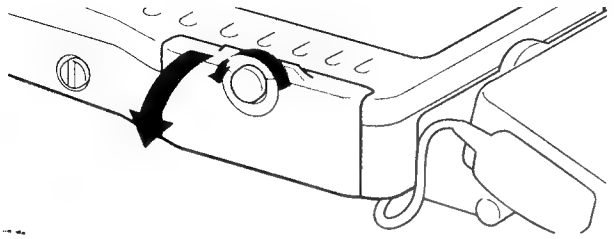
The slots are designed to be slightly stiff to protect the card and to prevent intrusion of dust and water.

Inserting Cards

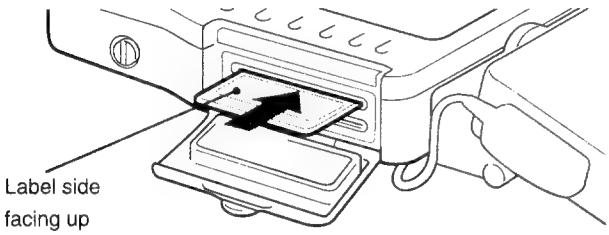
To insert a card into the IC memory card slot:

Note:
Turn off the power to the unit before inserting a card.

1 **Turn the screw toward "OPEN," then open the cover.**

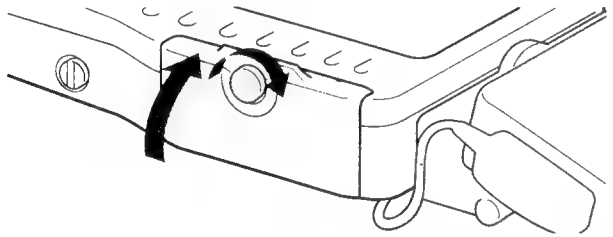


2 **Insert the card into the slot with label side facing up.**



Note:
To avoid damaging the slot, be sure to insert the card into the slot from the terminal-end with label side facing up.

3 **Close the cover and turn the screw toward "CLOSE" to tighten it.**

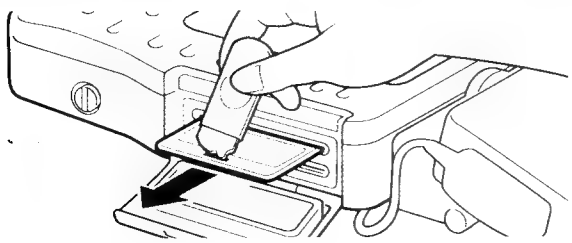


Removing Cards

To remove a card from the IC memory card slot:

Note:
Be sure to turn off the power to the unit before removing a card.

1 Loosen the screw toward "OPEN," then open the cover.
2 Put the tip of the utility key (supplied) into the groove of the card, then pull out the card using the utility key.



3 Close the cover and turn the screw toward "CLOSE."

About Map Cards and Point Database Cards

You can use commercially available cards, such as map cards that store and display map data on the screen and point database cards which store point databases that you can use for as navigation points. For details on the use of those cards, refer to the manuals that came with the cards.

You can set to display point icons of the points stored onto the cards using the Card Point Display option in the Display Setting menu (see page 70).

Note:
When you use a commercially available map card or point database card, the Geodetic System is set to the one employed on the card.

About IC Memory Cards

You can use IC memory cards to store data such as points, routes, etc. IC memory cards are useful when the unit memory is full or when you want to record flight or navigation records.

In CARD mode, you can store and copy data onto cards, copy the card's data to the unit memory, and use applications in cards.

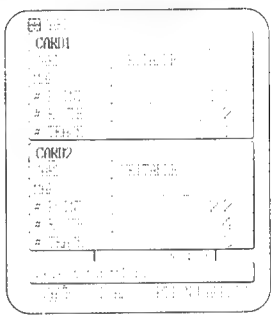
To enter CARD mode, press the CARD key.

Displaying the Card Information

The unit can display the following information about the card that is being used:
- Type of card
- Amount of memory used
- Amount of data (points, routes, and tracks) stored on the card

Use this information to check how much of the card's memory is used.

The card information is initially displayed when you press the CARD key.



Storing Data onto Cards

To store data onto a card:

1 **Press the F1 key (SAVE).**

2 **If the selected card to store data to is incorrect, choose MEMORY and select the correct card.**

3 **Select the type of data to store.**

4 **Select the names of data to store.**

You can select data listed in consecutive lines in the menu. To select data listed in consecutive lines:

1 Select the starting line, then press the F3 key (MULTSEL).
2 Select the ending line, then press the F3 key (MULTSEL).

5 **When you have finished selecting the names of data, press the ENTER or F2 key (ENTER).**

6 **Choose YES to store the data onto the card.**

To cancel storing data onto the card, press the F1 key (QUIT) or choose NO in step 6.

If the memory is full

If the message "Insufficient memory" appears, this indicates that the IC memory card's memory is full, which means that you will not be able to save the data until additional memory is made available. To make more memory available, first check the card's memory by pressing the CARD key to display "Card Information." Then either delete any unneeded data (points, routes, etc.) from the card, or move data from the card's memory to another IC card's memory.

Loading Data from Cards

You can load data from cards by copying the data to the unit's memory.

To load data from a card:

1 **Press the F2 key (LOAD).**

2 **If the selected card to load data to is incorrect, choose MEMORY and select the correct card.**

3 **Select the type of data to load.**

4 **Select the names of data to load.**

You can select data that are listed in consecutive lines in the menu. To select data listed in consecutive lines:

1 Select the starting line, then press the F3 key (MULTSEL).
2 Select the ending line, then select press the F3 key (MULTSEL).

5 **When you have finished selecting the names of data, press the ENTER or F2 key (ENTER).**

6 **Choose YES to load the data from the card.**

To cancel loading data from the card, press the F1 key (QUIT) or choose NO in step 6.

If the memory is full

If the message "Insufficient memory" appears, this indicates that the unit's memory is full, which means that you will not be able to save the data until additional memory is made available. To make more memory available, first check the unit's memory by choosing System Information from the menu. Then either delete any unneeded data (points, routes, etc.) from the unit's memory, or move data from the unit's memory to an IC card's memory.

Copying Data from a Card to Another Card

To copy data from one card to another card:

Note:
- Before copying data, turn off the unit, and insert both cards into the unit.
- You cannot copy data if the data is "copy protected."

1 **Press the F3 key (OPTION).**

2 **Choose COPY from the Option menu.**

3 **Select the type of data to copy.**

4 **Check the direction of copy by the arrows (card storing data to copy → card to copy data to). If the direction of copy is incorrect, choose DIRECTION OF COPY and select the right direction.**

5 **Select the names of data to copy.**

You can select data that are listed in consecutive lines in the menu. To select data listed in consecutive lines:
1 Select the starting line, then press the F3 key (MULTSEL).
2 Select the ending line, then press the F3 key (MULTSEL).

6 **When you have finished selecting the names of data, press the ENTER or F2 key (ENTER).**

7 **Choose YES to copy the data into the card.**

To cancel copying data, press the F1 key (QUIT) or choose NO in step 7.

If the memory is full

If the message "Insufficient memory" appears, this indicates that the IC memory card's memory is full, which means that you will not be able to save the data until additional memory is made available. To make more memory available, first check the card's memory by pressing the CARD key to display "Card Information." Then either delete any unneeded data (points, routes, etc.) from the card, or move data from the card's memory to another IC card's memory.

Initializing Cards

Initialize an IC memory card when you want to erase all its stored data.

Warning:
Data stored in the card is lost when you initialize the card.

To initialize a card:

1 **Press the F3 key (OPTION).**

2 **Choose INITIALIZE from the Option menu.**

3 **Choose YES to initialize the card.**

To cancel initializing the card, press the F1 key (QUIT) or choose NO in step 3.

Using Applications

You can purchase additional IC cards that contain various applications. The use of this unit may vary depending on these applications.

To start an IC application:

1 **Press the F4 key (APPLIC).**

2 **Select the name of the application.**
The application starts. To continue using the application, follow the instructions that came with the application.

To cancel starting an IC application, press the F1 key (QUIT).

Setting the Display

This section explains how to customize the unit's display so that it works best based on your individual needs.

You can change the following settings:

Present Position Display: Place the present position mark and the cross (+) cursor in the center of the screen or move it elsewhere. Default setting is "Fix."

Present Position Mark: Use the arrow mark (⊙) or the cross (+) cursor to display the present position. Default setting is "Arrow."

Scale Display: Display map scale. Default setting is "Off."

Selected Route: Display routes to your destination during Navigation. Default setting is "On."

Track Display: Display the last 100 points from the course travelled even if a track is not recorded. Default setting is "On."

LAT/LON (latitude and longitude) Display: Display latitude and longitude data of present position. Default setting is "On."

LAT/LON (latitude and longitude) Grid Display: Display latitude and longitude grid. You can set this option only when a map card is used. The grid is always displayed when a map card is not used or your current position is out of the map's display range. Default setting is "On."

Map Display: Display maps. You can set this option only when a map card is used. Default setting is "On."

Arrival Time: Select Estimated Time of Arrival (ETA) or Estimated Time Enroute (ETE). Because the unit calculates both times using a linear distance. the calculated time may be different from the actual time. Default setting is "ETE."

Card Point Display: Display point icons of the points stored onto the cards in the grid display. Default setting is "Off."

Course Deviation: Place North, Heading, or Course on top of radar screen. Default setting is "Course."

XTE (Cross Track Error): Display cross track error (course deviation indicator). Default setting is "On."

To change a display setting:

1 **Press the MENU key to enter MENU mode.**

2 **Choose DISPLAY SETTING from the menu.**

3 **Select the option of the setting using the ↑ ↓ key.**

4 **Change the setting using the ↑ ↓ key.**

To continue changing the settings, repeat steps 3 and 4.

When you have finished changing the settings, press the F2 key (END).

The unit backs up the previous settings when you change them. To change the setting to the previous setting, press the F3 key (CANCEL).

To cancel the display setting, press the F1 key (QUIT).

Setting the Positioning Conditions

This section explains how to change the settings of the positioning conditions.

You can change the following settings:

Geodetic System: Select the appropriate Geodetic System used to display latitude and longitude. To determine the Geodetic System used in your area, see "Table of Geodetic Systems" on page 84. Default setting is "WGS84."

Maximum DOP Value: Set acquired position accuracy. The smaller the value is, the higher the position accuracy becomes.
The unit updates data if the accuracy of the acquired data is higher than the accuracy set in this option.
To use the accurate data, set this option to "1 ~ 4." When set to "1 ~12," the unit uses the data that are acquired in poor reception conditions. Default setting is "1 ~ 12."

Note:
When the DOP value is more than 12 the unit cannot acquire your current position due to the increasing error.

Bearing: Set true or magnetic bearing (manual or automatic). When set to Manual Magnetic, enter the magnetic variation. The magnetic bearing may be different from the display of compass, etc. Default setting is "Auto."

Bearing Calculation: Set the calculation system for bearing and distance to Great Circle or Rhumb Line. Great Circle represents the shortest distance between two points on surface of sphere. Rhumb Line represents the line cutting all meridians at the same angle, or the line followed by a ship sailing in a fixed direction.Values for each setting are almost the same except for long distance travel such as crossing a continent or the Pacific Ocean, or the destination is in high latitude. Default setting is "Rhumb Line."

Unit of Position: Select latitude and longitude display: DMS (degrees/minutes/seconds) or DMD (degrees/minutes: minutes in decimal). Default setting is "DMD."

Unit of Distance: Select distance display: m (meter), mile (statute mile), or nmile (nautical mile). Default setting is "nmile."

Unit of Altitude: Select GPS altitude display: m (meter) or feet. Default setting is "feet."

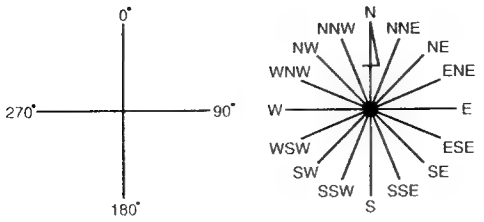
Unit of Speed: Select velocity display: km/h (kilometer per hour), mph (mile per hour), or knot. Default setting is "knot."

Update Rate: Set position update rate to Continuous or Interval. To conserve battery power, set to Interval. Default setting is "Continuous."
Pressing the GPS key turns the power to the antenna on and off according to the setting of the position update rate:

Position Update Rate	Power to the antenna (the GPS key's light)
Continuous	On (light is green) → Off (light is off) ↺
Interval	On at Interval (light is red) → On at Continuous (light is green) → Off (light is off) ↺

Note:
When the position update rate is set to Interval, the unit may not be able to acquire the position when it reaches or approaches the destination or specified zone. Therefore, the alarms and the cross track error display may not function, and you cannot store your current position using the MARK key.

Unit of Direction: Select direction display: degrees or compass points. Set to Degree when determining your travelling direction precisely. Set to Compass when determining your travelling direction roughly. Default setting is "Degrees."



Degree display NSEW display

GPS Reset: Initialize the antenna's orbital information. You have to wait for a while to acquire your current position after executing this option. Use this option if you cannot acquire your current position for more than 20 minutes after resetting your approximate position and place the antenna in a location with no line-of-sight obstructions.

To change a position setting:

1 **Press the MENU key to enter MENU mode.**

2 **Choose POSITION SETTING from the menu.**

3 **Select the option of the setting using the ↑ ↓ key.**

4 **Change the setting using the ↑ ↓ key.**

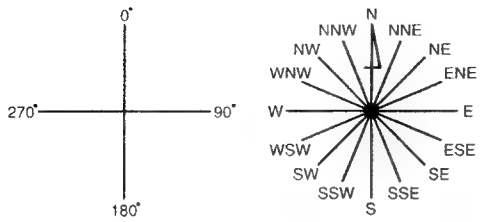
To continue changing the settings, repeat steps 3 and 4.

When you have finished changing the settings, press the F2 key (END).

The unit backs up the previous settings when you change them. To change the setting to the previous setting, press the F3 key (CANCEL).

To cancel the position setting, press the F1 key (QUIT).

Unit of Direction: Select direction display: degrees or compass points. Set to Degree when determining your travelling direction precisely. Set to Compass when determining your travelling direction roughly. Default setting is "Degrees."



Degree display NSEW display

GPS Reset: Initialize the antenna's orbital information. You have to wait for a while to acquire your current position after executing this option. Use this option if you cannot acquire your current position for more than 20 minutes after resetting your approximate position and place the antenna in a location with no line-of-sight obstructions.

To change a position setting:

1 **Press the MENU key to enter MENU mode.**

2 **Choose POSITION SETTING from the menu.**

3 **Select the option of the setting using the ↑ ↓ key.**

4 **Change the setting using the ↑ ↓ key.**

To continue changing the settings, repeat steps 3 and 4.

When you have finished changing the settings, press the F2 key (END).

The unit backs up the previous settings when you change them. To change the setting to the previous setting, press the F3 key (CANCEL).

To cancel the position setting, press the F1 key (QUIT).

Setting the Positioning Conditions

This section explains how to change the settings of the positioning conditions.

You can change the following settings:

Geodetic System: Select the appropriate Geodetic System used to display latitude and longitude. To determine the Geodetic System used in your area, see "Table of Geodetic Systems" on page 84. Default setting is "WGS84."

Maximum DOP Value: Set acquired position accuracy. The smaller the value is, the higher the position accuracy becomes.
The unit updates data if the accuracy of the acquired data is higher than the accuracy set in this option.
To use the accurate data, set this option to "1 ~ 4." When set to "1 ~12," the unit uses the data that are acquired in poor reception conditions. Default setting is "1 ~ 12."

Note:
When the DOP value is more than 12 the unit cannot acquire your current position due to the increasing error.

Bearing: Set true or magnetic bearing (manual or automatic). When set to Manual Magnetic, enter the magnetic variation. The magnetic bearing may be different from the display of compass, etc. Default setting is "Auto."

Bearing Calculation: Set the calculation system for bearing and distance to Great Circle or Rhumb Line. Great Circle represents the shortest distance between two points on surface of sphere. Rhumb Line represents the line cutting all meridians at the same angle, or the line followed by a ship sailing in a fixed direction.Values for each setting are almost the same except for long distance travel such as crossing a continent or the Pacific Ocean, or the destination is in high latitude. Default setting is "Rhumb Line."

Unit of Position: Select latitude and longitude display: DMS (degrees/minutes/seconds) or DMD (degrees/minutes; minutes in decimal). Default setting is "DMD."

Unit of Distance: Select distance display: m (meter), mile (statute mile), or nmile (nautical mile). Default setting is "nmile."

Unit of Altitude: Select GPS altitude display: m (meter) or feet. Default setting is "feet."

Unit of Speed: Select velocity display: km/h (kilometer per hour), mph (mile per hour), or knot. Default setting is "knot."

Update Rate: Set position update rate to Continuous or Interval. To conserve battery power, set to Interval. Default setting is "Continuous."
Pressing the GPS key turns the power to the antenna on and off according to the setting of the position update rate:

Position Update Rate	Power to the antenna (the GPS key's light)
Continuous	On (light is green) → Off (light is off)
Interval	On at Interval (light is red) → On at Continuous (light is green) → Off (light is off)

Note:
When the position update rate is set to Interval, the unit may not be able to acquire the position when it reaches or approaches the destination or specified zone. Therefore, the alarms and the cross track error display may not function, and you cannot store your current position using the MARK key.

Setting the Clock

This section explains how to change the settings of the unit's internal clock.

You can change the following settings:

Time Difference: Adjust the time difference between your local time and UTC time. To determine the time difference of major cities in the world, see "Time Difference Chart" on page 83. Default setting is "+ 00:00."

DST (Daylight Saving Time): Select daylight saving time, which advances time one hour. Default setting is "Off."

Time Format: Select time format as 12-hour or 24-hour. Default setting is "24H."

Date Format: Select date format as yymmdd (year/month/date), mmddyy (month/date/year), or ddmmyy (date/month/year). Default setting is "mmddyy."

To change a time setting:

1 **Press the MENU key to enter MENU mode.**

2 **Choose TIME SETTING.**

3 **Select the option of the setting using the ↑ ↓ key.**

4 **Change the setting using the ↑ ↓ key.**
To set the time difference, use the ← → key.

To continue changing the settings repeat steps 3 and 4.

When you have finished changing the settings, press the F2 key (END).

The unit backs up the previous settings when you change them. To change the setting to the previous setting, press the F3 key (CANCEL).

To cancel the time setting, press the F1 key (QUIT).

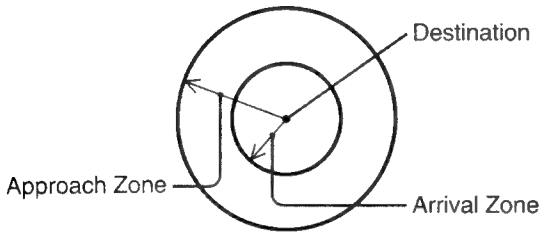
Setting the Alarms

This section explains how to change the settings of the unit's navigation alarms.

You can change the following settings to customize three types of alarms you can use during navigation:

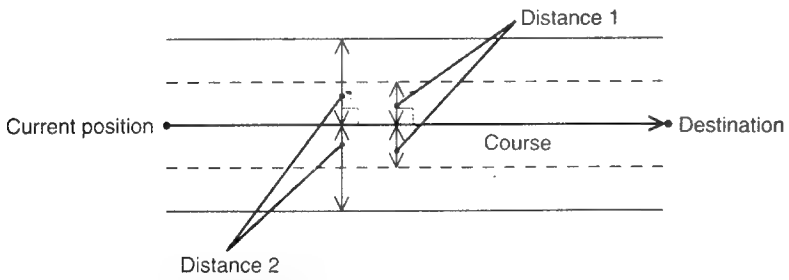
Destination Alarm: Set the alarm when approaching or arrived at your destination. Distances (radius of zone) to determine approach or arrival can be set. Default settings are: the alarm is "Off," Arrival Zone is "0.5 nautical mile," and Approach Zone is "1.5 nautical mile."

Note:
Approach Zone must be larger than Arrival Zone.



XTE (Cross Track Error) Alarm: Set the course deviation alarm during navigation. Distances to determine acceptable limit of the course deviation can be set in two stages. Default settings are: the alarm is "Off," Distance 1 is "0.5 nautical mile," and Distance 2 is "1 nautical mile."

Note:
Distance 2 must be larger than Distance1.



Zone Alarm: Set the alarm when entering the specified zone. To specify zone, refer to "Specifying Zones" on page 53. Default setting is "Off."

Setting the Alarms

To change an alarm setting:

1 **Press the MENU key to enter MENU mode.**

2 **Choose ALARM SETTING from the menu.**

3 **Select the option of the setting using the ↑ ↓ key.**

4 **Change the alarm setting to ON or OFF using the ↑ ↓ key.**

5 **When setting the distances, enter values for each setting using the directional cursor key.**

To select the position or digit to enter data, move the cursor using the ‹ › key.
To enter data, select numbers using the ↑ ↓ key.

Note:
You can only set the distances in 0.1 nautical mile unit.

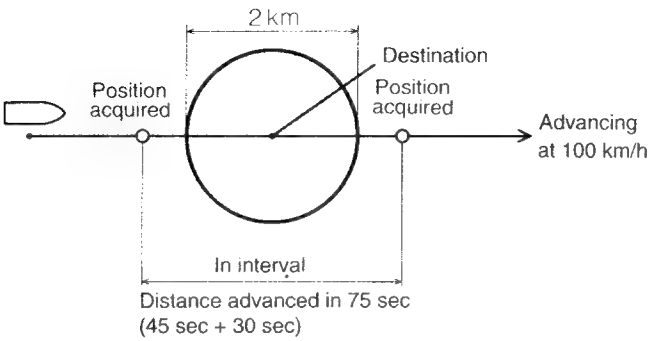
To continue changing the settings, repeat steps 3 and 4.

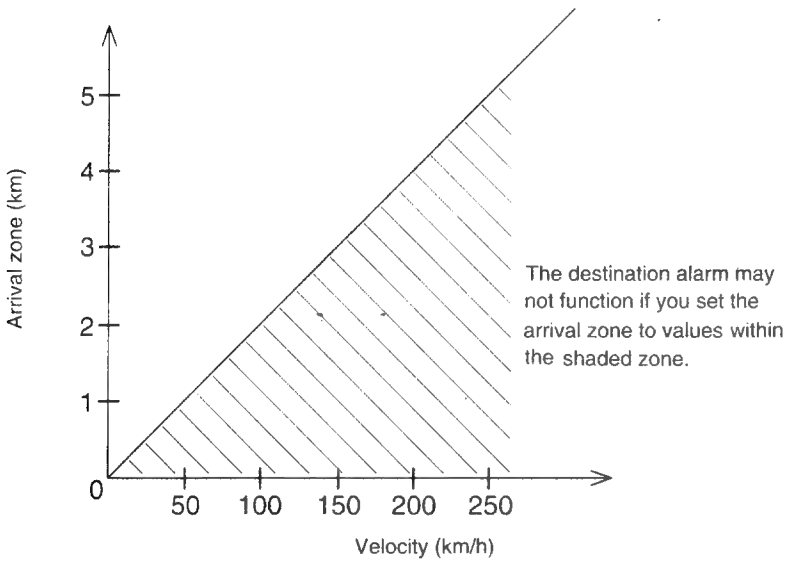
When you have finished changing the settings, press the F2 key (END).

The unit backs up the previous settings when you change them. To change the setting to the previous setting, press the F3 key (CANCEL).

To cancel the alarm setting, press the F1 key (QUIT).

Note on setting the position update rate to Interval:
The following graph indicates the distance of arrival zone versus the velocity when the unit is in interval for 45 seconds and then starts acquiring the current position within 30 seconds. For example, when the unit is advancing at 100 km/h, you must set the arrival zone to more than 2 km. Otherwise, the unit may be in interval when it reaches the arrival zone, so that it may not be able to determine its arrival and beep the alarm.





When the position update rate is set to Interval, the unit may not be able to acquire the position when it reaches or approaches the destination or specified zone. Therefore, the alarms and the cross track error display may not function, and you cannot store your current position using the MARK key.

Changing the System Settings

This section explains how to change the system settings, such as language and present position settings. The beep volume and screen contrast can also be set here.

You have already set some of the options in the System Setting menu on initial setting. In the System Setting menu, you can change the following settings:

Language: Select the language you want to use.
Default setting is "English."

Beep Volume: Adjust the beep volume. Default setting is "High."

Memory Device: Select type of memory (unit, card1, or card2) to save new data. Default setting is "Unit." The setting is always changed to Unit when the power is turned on.

Screen Contrast: Adjust the screen contrast.

Position Reset: Reset your approximate position when you transport the unit to a distance with power turned off.

To change a system setting:

1 **Press the MENU key to enter MENU mode.**

2 **Choose SYSTEM SETTING from the menu.**

3 **Select the option of the setting using the ↑ ↓ key.**

4 **Change the setting using the ↑ ↓ key.**

To adjust the screen contrast, use the ← → key. To increase the contrast, use the ↑ key; to decrease the contrast, use the ↓ key.

To reset your present position, specify the position using the directional cursor key.

To continue changing the settings, repeat steps 3 and 4.

When you have finished changing the settings, press the F2 key (END).

The unit backs up the previous settings when you change them. To change the setting to the previous setting, press the F3 key (CANCEL).

To cancel the system setting, press the F1 key (QUIT).

Using Optional Accessories

The following optional accessories are available to help you use the IPS-760.

Power sources

In addition to alkaline batteries, you can use the following power sources:

- NP-IPS76 rechargeable battery pack
- Car battery (12/24 V), using the DCC-E260HG car battery cord

Using the rechargeable battery pack
You can use the Sony NP-IPS76 rechargeable battery pack (not supplied) to supply power to your unit. The unit can operate continuously for about 3 hours on the NP-IPS76 battery. Charge the battery when using it for the first time. To charge the battery, use the charger that came with the BC-IPS76K rechargeable battery kit package. For details on use of the battery, refer to the manual that came with the BC-IPS76K rechargeable battery kit.

Using a car battery (12/24 V)
You can use the battery of your car to supply power to the unit. When using a car battery, you need to use the Sony DCC-E260HG car battery cord. For details on use of a vehicle battery, refer to the manuals that came with the car battery cord, etc.

When using a vehicle battery to power the unit, make sure the unit is turned off before you turn the ignition on or off.

12/24 V CAR BATTERY
Use the Sony DCC-E260HG car battery cord (not supplied), and connect the unit DC IN 6V jack to the cigarette lighter socket of a car.

Installation and connection

- MAK-IPS76 mount kit
- EXC-IPS7 antenna extension cable (7 m, 23 ft)

Maintenance

- Contact cleaning tissue

IC memory cards

- IPM-032K 32 kbyte memory card

Troubleshooting

This section describes troubleshooting tips. Use the tables below if you have any problems with the unit. If problems continue, consult your nearest Sony Service Center.

Common Problems

The following checks will help you correct problems that you may encounter with your unit. Before going through the checklist below, first refer back to the connection and operating procedures.

Problem	Cause	Corrective Action	Reference Page
The unit does not power on when you press the POWER button.	The battery is discharged. The cover of the IC memory card slots are open. The battery magazine is not properly inserted into the unit.	Replace the battery. Close the cover, then tighten the screw. Insert the battery magazine until the BATTERY RELEASE screw returns to center.	16 63 16
The battery is discharging too quickly.	The backlight has been frequently used.	To conserve the battery, use the backlight only when necessary.	17
The unit does not receive any data from the GPS satellites, even after waiting for a considerable period.	The GPS key is turned off. The location of the antenna is not ideal for receiving GPS satellite signals.	Press the GPS key to turn on the antenna. Move the antenna to a better location.	13 22
You cannot store your current position when you press the MARK key.	The unit does not have enough satellites to determine position. When the position update rate is set to Interval, you cannot store your current position using the MARK key.	Move the antenna to another location, where there are fewer obstructions. When the position update rate is set to Interval, press the GPS key to change the rate to Continuous (the light turns green); or change the setting of the position update rate to Continuous in the Position Setting menu. Then press the MARK key. The MARK key will be turned on and the current position will be stored.	22 13, 72
The unit does not update latitude and longitude data.	The unit does not have enough satellites to determine position.	Move the antenna to another location, where there are fewer obstructions.	22
You cannot acquire your current position for more than 20 minutes after resetting your approximate position and place the antenna in a location with no line-of-sight obstructions.	You have moved a long distance, such as the back of the earth.	Initialize the antenna's orbital information using the GPS Reset option in the Position Setting menu.	73
You cannot read the display well.	The screen contrast setting is incorrect.	Adjust the screen contrast.	18, 78
You cannot use the IC memory card.	The card terminals are dirty. The card is not propely inserted into the slot. The card is inserted into the slot upside down.	Clean the card terminals with the cleaning tissue (supplied). Insert the card fully. Insert the card with label side facing up.	10, 62 63 63
The screen does not appear while using the IC memory card.	The card terminals are dirty. Or, the card terminals are corroded because the card was not used for an extended period of time.	• Clean the card terminals with the cleaning tissue (supplied). • Put the card in and out of the slot several times, then insert the card back into the slot.	10, 62 63
The time display in the Word Clock is incorrect.	The timing information is not received because the antenna is not connected and the GPS key is turned off.	Check connection of the anntenna and press the GPS key to turn on the antenna.	13, 22
The display responds slower than usual.	You have set too many zones. Too many point icons are displayed in the grid display.	Release the setting of unneeded zones. • Search for necessary points to be displayed on the grid display. • Set the display of the point icons to off using the Card Point Display option in the Display Setting menu.	55 35 70

System Messages

The following checks will help you correct problems when system messages appear on the screen. The messages are listed alphabetically.

The messages appear in dialog boxes. Some dialog boxes include an YES button and a NO button to respond to the messages.

Message	Cause	Correective Action	Reference Page
Antenna disconnected.	• The antenna cable is disconnected while you are using the unit. • The power is turned on while the antenna is disconnected.	Connect the antenna to the display/keyboard unit.	22
Battery empty! Turn off power and replace battery.	The battery is completely discharged.	Replace the battery immediately.	16
Beyond grid display unit. Cannot display position higher than latitude of display limit.	Because the unit employs the equidistant cylindrical projection, some deformation of shape towards the poles can be seen in the grid display. When the latitude is more than 70 degrees North or South, the grid is not displayed due to the considerable deformation of shape.	Return your position to the location under latitude 70 degrees. The unit returns to the normal operation.	29
Card 1/Card 2 malfunction. Restore usable data?	The unit cannot use the data from the card 1/ card 2 due to the memory malfunction.	To restore the usable data from the card 1/card 2, choose Yes. To abort all the data in the card 1/card 2 and initialize the card 1/card 2, choose NO.	–
Card 1/Card 2 malfunction. Unit will be powered on again.	The unit cannot use the data from the card 1/ card 2 due to the memory malfunction.	The unit automatically shuts down and powers on again.	
Card seated improperly. Turn off power and reinsert card.	The card is not properly inserted into the slot. The card is inserted into the slot upside down.	Insert the card fully. Insert the card with label side facing up.	63 63
Card terminals are dirty and/ or scratched. Clean card terminals with cleaning tissue.	The card terminals are dirty and/or scratched.	Clean the card terminals with the cleaning tissue (supplied).	10, 62
Card unreadable. Turn off power and reinsert card.	The card terminals are dirty.	Clean the card terminals with the cleaning tissue (supplied).	10, 62
Card unusable.	The card that has no PXS mark is used.	Use a card that has the PXS mark.	62
Card unusable. Initialize card.	You cannot use the card due to the memory malfunction.	Choose Initialize from the Option menu in Card mode to initialize the card.	68
Check antenna connection and press the "GPS" key.	The antenna cable is not properly connected. The GPS key is turned off.	Check connection of the antenna cable, then press the GPS key to turn on the antenna. Press the GPS key to turn on the antenna	13, 22 13
Data malfunction. Returned to initial settings. Reset data if necessary.	The current settings of data that you have customized in the menu are returned to the initial settings due to data malfunction.	Check the menu settings. Change the setting if necessary. If the data of the initial settings malfunction, the unit displays the initial setting screen. Make the initial settings again.	18, 70-78
Internal lithium battery low. Refer to the manual for replacement.	The built-in lithium batteries are discharged.	Have the lithium batteries replaced by a Sony dealer or any Sony Service Center.	17
Markpoint failed. Satellite reception poor.	The unit does not have enough satellites to determine position. When the position update rate is set to Interval, you cannot store your current position using the MARK key.	Move the antenna to another location, where there are fewer obstructions. When the position update rate is set to Interval, press the GPS key to change the rate to Continuous (the light turns green); or change the setting of the position update rate to Continuous in the Position Setting menu. Then press the MARK key. The MARK key will be turned on and the current position will be stored.	22 13, 72

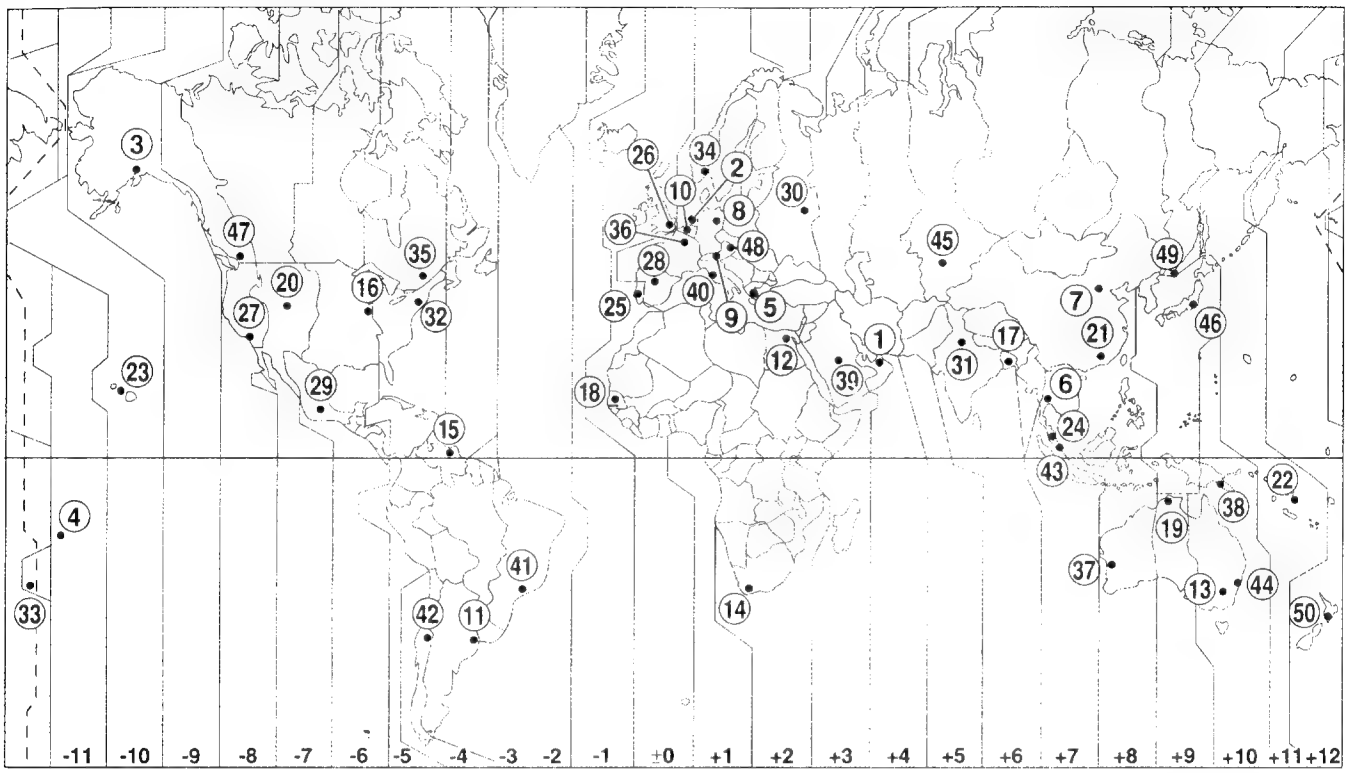
Troubleshooting

Message	Cause	Corrective Action	Reference Page
Navigation mode, Track mode, XTE, or Zone may not be provided when position update rate is set to interval.	Because the position update rate is set to Interval, the unit may not be able to acquire the position when it reaches or approaches the destination or specified zone, and the alarms and the cross track error display may not function.	• When the position update rate is set to Interval, press the GPS key to change the rate to Continuous (the light turns green); or change the setting of the position update rate to Continuous in the Position Setting menu. • When setting the alarms, make the settings of the values for the destination alarms and cross track error alarms larger.	13, 72 75
Power was turned off during access to memory. Check memory contents.	The data may not be stored or copied if you turn off the unit while the unit is storing or copying data.	Choose System Information from the menu to check the contents of the unit's memory. Or press the CARD key to check the contents of the card's memory.	59, 64
Present position cannot be stored when position update interval rate is set to interval. To store present position, press the "GPS" key to change position update rate to continuous.	When the position update rate is set to Interval, you cannot store your current position using the MARK key.	When the position update rate is set to Interval, press the GPS key to change the rate to Continuous (the light turns green); or change the setting of the position update rate to Continuous in the Position Setting menu. Then press the MARK key. The MARK key will be turned on and the current position will be stored.	13, 72
Reset present position when you use the unit after you have moved a long distance with power turned off.	The data regarding your present position may be lost when you use the unit after you have moved a long distance with power turned off.	Reset your present position in the System Setting menu.	78
Satellite reception poor.	The GPS key is turned off. The location of the antenna is not ideal for receiving GPS satellite signals.	Press the GPS key to turn on the antnna. Move the antenna to a better location.	13 22
System malfunction. Turn off power. Clean the card terminals and check power supply.	The unit has malfunctioned because the card terminals are dirty and/or scratched. The unit has malfunctioned because the battery is not properly installed.	Clean the card terminals with the cleaning tissue (supplied). Check that the battery is properly installed into the unit.	10, 62 16
Unit memory malfunction. Erase memory.	You cannot use the unit's memory due to the memory malfunction.	Choose Erase Memory from the menu to initialize the memory.	60
Unit memory malfunction. Restore usable data?	The unit cannot use the data from the unit's memory due to the memory malfunction.	To restore the usable data from the unit's memory, choose YES. To abort all the data in the unit's memory and initialize the unit's memory, choose NO.	–
Unit memory malfunfction. Unit will be powered on again.	The unit cannot use the data from the unit's memory due to the memory malfunction.	The unit automatically shuts down and powers on again.	–
Warning! Battery low.	The battery is discharged.	Replace the battery.	16

Reference Charts

Time Difference Chart

Use the following chart to set the time difference between your local time and UTC time (see page 74). You can also display the local time of the major cities in the world listed in the following table using the world clock (see page 58).



	City	Time Difference
1	Abu Dhabi	+4:00
2	Amsterdam	+1:00
3	Anchorage	-9:00
4	Apia	-11:00
5	Athens	+2:00
6	Bangkok	+7:00
7	Beijing	+8:00
8	Berlin	+1:00
9	Bern	+1:00
10	Bruxelles	+1:00
11	Buenos Aires	-3:00
12	Cairo	+2:00
13	Canberra	+10:00
14	Cape Town	+2:00
15	Caracas	-4:00
16	Chicago	-6:00
17	Dacca	+6:00
18	Dakar	±0:00
19	Darwin	+9:30
20	Denver	-7:00
21	Hong Kong	+8:00
22	Honiara	+11:00
23	Honolulu	-10:00
24	Kuala Lumpur	+8:00
25	Lisbon	±0:00

	City	Time Difference
26	London	±0:00
27	Los Angeles	-8:00
28	Madrid	+1:00
29	Mexico City	-6:00
30	Moscow	+3:00
31	New Delhi	+5:30
32	New York	-5:00
33	Nuku'alofa	+13:00
34	Oslo	+1:00
35	Ottawa	-5:00
36	Paris	+1:00
37	Perth	+8:00
38	Port Moresby	+10:00
39	Riyadh	+3:00
40	Rome	+1:00
41	Rio de Janeiro	-3:00
42	Santiago	-4:00
43	Singapore	+8:00
44	Sydney	+10:00
45	Tashkent	+6:00
46	Tokyo	+9:00
47	Vancouver	-8:00
48	Vienna	+1:00
49	Vladivostok	+10:00
50	Wellington	+12:00

Table of Geodetic Systems

To set the Geodetic System of your area, choose the Geodetic System option in the Position Setting menu (see page 72). The available options are listed in the following chart under Geodetic System. Additionally, the worldwide coordinate area, WGS84, is available as an option.

Area / Country		Geodetic System
AFRICA	Ethiopia Mali Senegal Sudan	ADINDAN
	Botswana Lesotho Malawi Swaziland Zaire Zambia Zimbabwe South Africa	ARC 1950
	Morocco	MERCHICH
ASIA	Japan Korea	TOKYO
	Hong Kong	HONG KONG 1963
	Singapore	SOUTH ASIA
	Philippines	LUZON
	Thailand Vietnam	INDIAN-1
	Bangladesh India Nepal	INDIAN-2
	West Malaysia Singapore	KERTAU 1948
CENTRAL AMERICA	Belize Costa Rica El Salvador Guatemala Honduras Nicaragua Mexico	N. AMERICAN 1927-1
EUROPE	Austria Belgium Cyprus Channel Islands Denmark England Finland France Germany Gibraltar Greece Ireland Italy Luxembourg Netherlands Norway Portugal Scotland Shetland Islands Spain Sweden Switzerland	EUROPEAN 1950

Area / Country		Geodetic System
EUROPE	Ireland	IRELAND 1965
	England Isle of Man Scotland Shetland Islands Wales	GREAT BRITAIN 63
MIDDLE EAST	Masirash Island Oman United Arab Emirates	NAHRWAN-1
	Saudi Arabia	NAHRWAN-2
	Egypt	OLD EGYPTIAN 1930
NORTH AMERICA	Canada Newfoundland Island	N. AMERICAN 1927-2
	Alaska Canada Mexico Central America United States of America	N. AMERICAN 1983
OCEANIA	Australia Tasmania Island	AUSTRALIAN GEO. 84
	New Zealand	GEO. DATUM 1949
SOUTH AMERICA	Bolivia Chile Colombia Ecuador Guyana Peru Venezuela	S. AMERICAN 1956
	Argentina Bolivia Brazil Chile Colombia Ecuador Guyana Paraguay Peru Trinidad and Tobago Venezuela	S. AMERICAN 1969
	Argentina	CAMPO INCHAUSPE
	Brazil	CORREGO ALEGRE

Appendix D

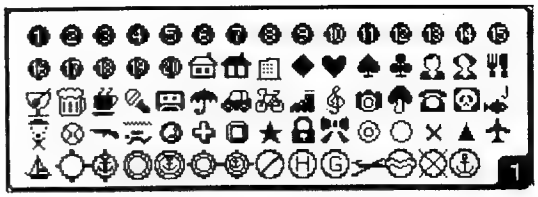
Display Symbols and Abbreviations

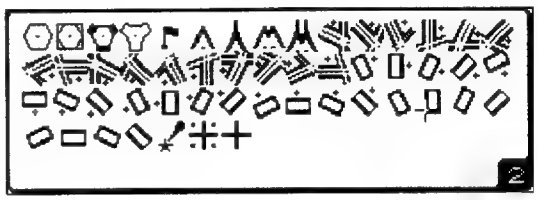
The display symbols and abbreviations used on the screen are listed in the following charts with their meanings. The available point icons are also shown here.

Display symbols

Display Symbol	Meaning
	Current position and direction
	+ cursor for specifying destination
	Three-dimentional position
	Two-dimentional position
	Position impossible to acquire
	Navigating (Route Navigation)
	Navigating (Quick Navigation)
	Tracking
	Map zoom out
	Map zoom in
	Battery low warning
	Daylight saving time
	Cross track error
	Magnetic bearing
	Starting point of tracking
	Ending point of tracking

Point icons





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ASIA	Japan Korea	TOKYO
	Hong Kong	HONG KONG 1963
	Singapore	SOUTH ASIA
	Philippines	LUZON
	Thailand Vietnam	INDIAN-1
	Bangladesh India Nepal	INDIAN-2
	West Malaysia Singapore	KERTAU 1948
CENTRAL AMERICA	Belize Costa Rica El Salvador Guatemala Honduras Nicaragua Mexico	N. AMERICAN 1927-1
EUROPE	Austria Belgium Cyprus Channel Islands Denmark England Finland France Germany Gibraltar Greece Ireland Italy Luxembourg Netherlands Norway Portugal Scotland Shetland Islands Spain Sweden Switzerland	EUROPEAN 1950

Area / Country		Geodetic System
EUROPE	Ireland	IRELAND 1965
	England Isle of Man Scotland Shetland Islands Wales	GREAT BRITAIN 63
MIDDLE EAST	Masirash Island Oman United Arab Emirates	NAHRWAN-1
	Saudi Arabia	NAHRWAN-2
	Egypt	OLD EGYPTIAN 1930
NORTH AMERICA	Canada Newfoundland Island	N. AMERICAN 1927-2
	Alaska Canada Mexico Central America United States of America	N. AMERICAN 1983
OCEANIA	Australia Tasmania Island	AUSTRALIAN GEO. 84
	New Zealand	GEO. DATUM 1949
SOUTH AMERICA	Bolivia Chile Colombia Ecuador Guyana Peru Venezuela	S. AMERICAN 1956
	Argentina Bolivia Brazil Chile Colombia Ecuador Guyana Paraguay Peru Trinidad and Tobago Venezuela	S. AMERICAN 1969
	Argentina	CAMPO INCHAUSPE
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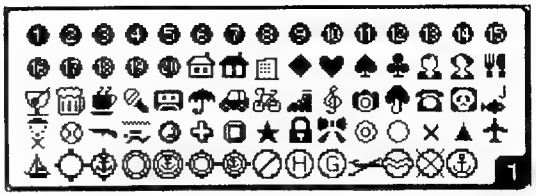
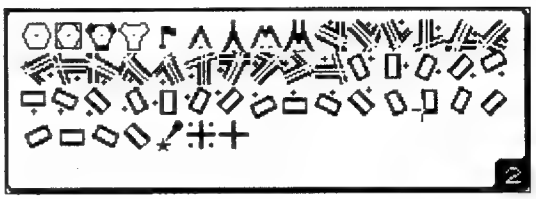
	Navigating (Quick Navigation)
	Tracking
	Map zoom out
	Map zoom in
	Battery low warning
	Daylight saving time
	Cross track error
	Magnetic bearing
S	Starting point of tracking
E	Ending point of tracking

Point icons





Display Symbols and Abbreviations

Abbreviations

Abbreviation	Meaning
ALL	Search for all data
APPLIC	Application
ARRIV ZONE	Arrival Zone
CALC	Calculation
CARD	CARD mode
CHGCITY	Change cities
ddmmyy	Date format (date/month/year)
DISP	Display
DIST	Distance
DMD	Latitude and longitude data (degrees/minute; minutes in decimal)
DMS	Latitude and longitude data (degrees/minutes/seconds)
DOP	Dilution of Precision
DST	Daylight saving time
DSTN	Destination
E	East
ETA	Estimated Time of Arrival
ETE	Estimated Time Enroute
FNL ENT	Enter final data
GEO SYS	Geodetic System
GPS	Global Positioning System
GPS ALT	GPS altitude
GR CIRCLE	Great circle
IN AREA	Search for data within the displayed area
INIT	Initialize
km	Kilometer
km/h	Kilometer per hour
LAT	Latitude
LAT/LON	Latitude and longitude
LON	Longitude
m	Meter
MAG	Magnetic bearing
MARK	MARK mode
MENU	MENU mode
mile	Statute mile
mmddyy	Date format (month/date/year)
mph	Miles per hour
MULTSEL	Select multiple data
N	North
NAV	Navigation
NEW	Create new points/routes
nmile	Nautical mile
PASS PT	Passing point
POINT	POINT mode
POS	POS mode, position
PT	Point
QK NAV	Quick Navigation
REVERSE	Reverse the route
ROUTE	ROUTE mode
RT NAV	Route Navigation
S	South
SEARCHP	Search for points
SEARCHR	Search for routes
SEARCHT	Search for tracks
SYS INFORMATION	System Information
UTC	Universal Time Coordinated
W	West
WGS84	World Geodetic System 1984
XTE	Cross Track Error
yymmdd	Date format (year/month/date)
12H	12-hour
24H	24-hour

Point Types

First Category	Second Category
Water	Beach River Lake Other
Land	Mountain Desert Island Other
District	Country Order 1 Area Order 2 Area Order 3 Area Other
Transport	Road Railway Airport Harbour Other
Culture	Park, Monument Historic Site, Memorial Military Establishment Place of Interest Church, Monastery Ruins Castle Lighthouse Dam Other
Other	Information Leisure, Sport Restaurant Museum, Library Other

Specifications

Physical characteristics

Dimensions
- Overall: Approximately 110 x 230 x 34 mm (w/h/d) (4 3/8 x 9 1/8 x 1 3/8 in)
- Antenna: Approximately 90 x 70 x 26 mm (w/h/d) (3 5/8 x 2 7/8 x 1 1/16 in)
- Display/Keyboard: Approximately 110 x 152 x 34 mm (w/h/d) (4 3/8 x 6 x 1 3/8 in)

Weight Approximately 833 g (1 lb 13 oz), including six R6 (size AA) batteries and two cards

Display STN-type dot matrix, 256 x 320 dots

Operating environment

Waterproof

Operating temperature

Antenna: -20 °C ~ 70 °C (-4.0 °F ~ 158 °F)

Display/Keyboard: 0 °C ~ 40 °C (32 °F ~ 104 °F)

Electrical characteristics

Reception

1575.42 MHz, C/A Code

8 channel (simultaneous track system)

Sensitivity: -130 dBm

Power requirements

R6 (size AA) alkaline batteries x 6 (not supplied)

Battery life: about 4 hours of continuous operation, about 2 hours using the backlight

NP-IPS76 Rechargeable battery pack (not supplied)

Battery life: about 3 hours of continuous operation, about 2 hours using the backlight

External power voltage 6V DC, 500 mA (standard value using the backlight

Data Characteristics

Accuracy
- Position: 9 m (30 ft) with DOP ≤ 4 and S/A OFF (1.5 σ)
- Velocity: 0.56 km/h (0.35 mph, 0.3 knots) with DOP ≤ 4 and S/A OFF (1.5 σ)
- Altitude: 25 m (83 ft) with DOP ≤ 4 and S/A OFF (1.5 σ)

Positioning time Approximately 1 minute

Data renewal Approximately 1 second

Operational Characteristics

Maximum velocity 500 km/h (310 mph, 270 knots)

Memory capacity 96 kilobytes

For example: Number of points 400
Number of routes 50
Number of tracks 5

Supplied accessories

- Floating belt (1)
- Antenna extension cable (3 m, 10 ft) (1)
- Carrying strap (1)
- Utility key (2)
- Carrying case (1)
- Velcro tapes (1)
- Two-sided adhesive tapes (1)
- Contact cleaning tissue (3)
- Battery magazine (1)
- Operating Instructions (1)
- Quick Start card (1)

Design and specifications are subject to change without notice.

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